

THE IRON AGE

THURSDAY, DECEMBER 5, 1889.

New Filtering Material.

At the last regular meeting of the Engineer's Club of Philadelphia a working model was exhibited of the Rimmer oxidizer, a filtering material for which very strong claims are made. It is claimed that this material will absorb and retain a large quantity of oxygen from the atmosphere. In use it is charged daily with atmospheric air, when, it is claimed, a reaction takes place with the impurities which have accumulated in the filtering material, and that the result passes off in the form of gas. It is claimed that metals in solution in the water will form insoluble oxides. The upper layer of the filtering plant consists of sand for the removal

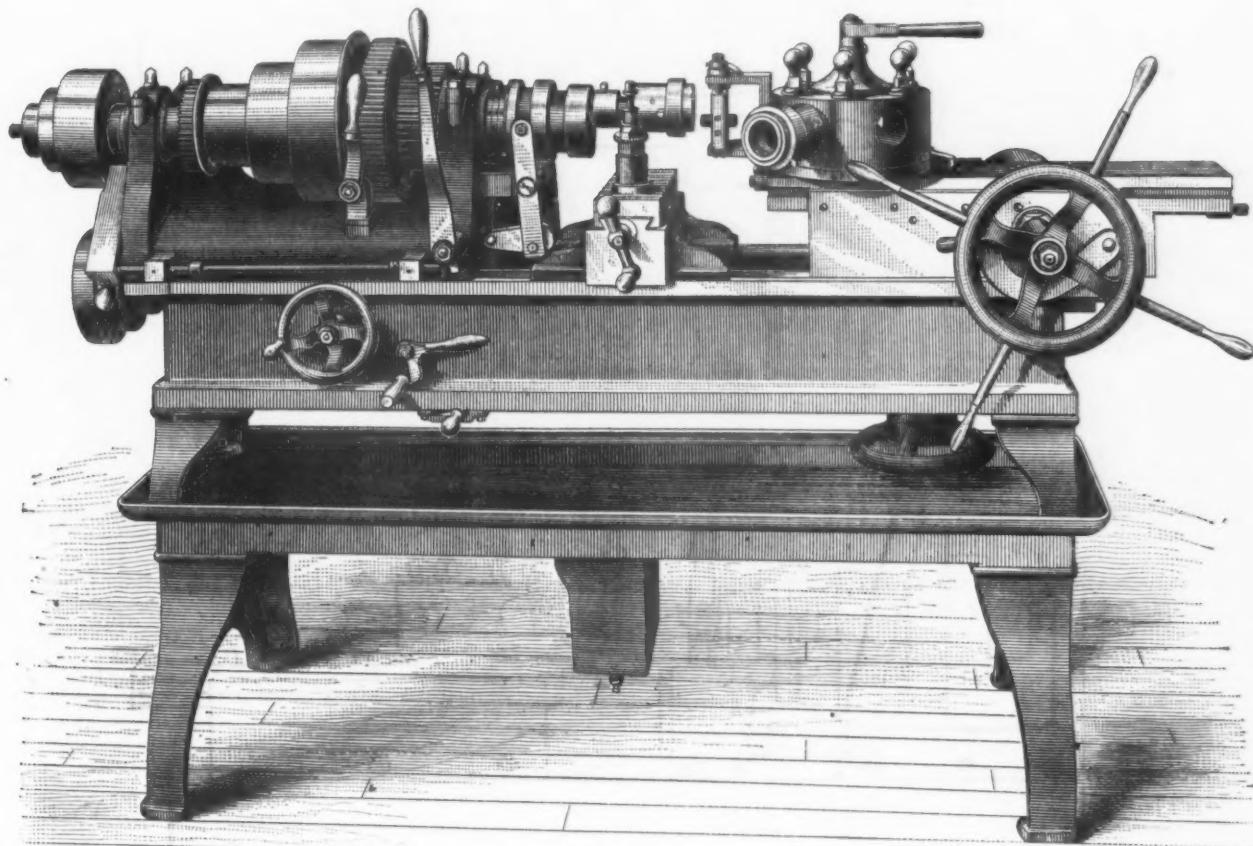
and tests seemed to fail to discover any trace of the impurities. A mixture of copying-ink and water was passed through the filter with the same results.

Testing the Speed of Vessels.—In the recent tests of government cruisers, where the speed was measured by patent logs, some very anomalous results have been observed. Thus, in the trial of the Baltimore an observation showed a speed of 20.6 knots an hour, when the indicated horse-power developed by the engines was about 200 less than that shown when the speed was only 19.6 knots. Two patent logs have occasionally been used in long runs, and in no case did they give the same indications, neither were their

New Screw Machine.

The accompanying engravings represent a new style of screw machine built by Jones & Lamson Machine Company, of Springfield, Vt. It is designed for working from a continuous bar without stopping the machine. The back-gears, roller-feed and automatic chuck are all operated while the machine is running. Both ends of the work may be finished without a second handling, without stopping the machine, and bolt-heads may be given an extra finish when something better is required than the surfaces left by the cut-off tool.

The turret revolves automatically and is provided with power-feed. The curved



SCREW MACHINE FOR FINISHING BOTH ENDS OF WORK WITHOUT SECOND HANDLING.

of suspended matter by mechanical filtration, and the lower layer of the material above described for the chemical removal of impurities in solution.

The following tests were made in the presence of the meeting: The filtering materials were contained in a large glass funnel. Water as muddy as that of the Schuylkill River during freshets was made apparently perfectly clear. A solution of sulphate of iron in water was made and a portion thereof passed through the filter. The unfiltered and filtered portions were then tested with ferrocyanide of potassium. The former showed a distinct blue tint, while the latter remained perfectly clear, showing the elimination of the iron. Lead and copper tests seemed to show the same results. To illustrate the destruction of organic matter, sulphide of ammonia, sulphide of iron and acetate of lead were added to water, making a compound which was almost black and of strong and unpleasant odor. After filtration it was clear,

rates of variation constant. Now that the contracts for building men-of-war are usually made with a premium for increased and a penalty for decreased speed, referred to contract speed, an accurate method of measuring this speed becomes very important. Various plans have been suggested, the most feasible of which are as follows: To lay off a long measured course of 50 or 60 nautical miles, between prominent headlands, and to run the vessel over this course, in lieu of the four hours' test; to lay off a course of five or ten knots, over which the vessel shall be run back and forth during a period of four hours, assuming that the speed when turning is the same as the average speed over the course.

Improved poppet-valves for the inclined multi-cylinder expansion engines of the new Fall River steamer Plymouth have been designed by Stevenson Taylor, of the North River Iron Works.

lever just back of the pilot-wheel in the perspective view is for throwing this into and out of gear, and is provided with a new and ingenious knock-off that may be readily set, so that it will accurately mill, drill or thread the length desired.

The carriage may be operated by the hand-wheel on left of bed; the handle near it is to throw in and out the reversible power-feed with which it is provided. A rotary pump keeps the oil in circulation, pumping from the reservoir beneath the drainage-bed.

An extra spindle, shown in plan view, is used which occupies the position of the ordinary back-gear and the back-gear is placed under the main spindle. This extra or supplementary spindle carries a die, mill or drill, as may be required by the work. A chuck is attached to the turret which receives the work as it is cut from the bar of stock. The backward motion of the stud turns the turret one-sixth of a revolution, at the same time automatically

gripping the piece cut off and bringing it into line with the die, mill or drill carried by the supplemental spindle, so that the next forward motion of the turret carries the work to the tool in the supplemental spindle. On stud and similar work two dies are cutting at the same time and both ends of work are threaded.

The operation of the second-end attachment is entirely automatic, requiring no special attention of the operator. It occupies but one hole in the turret; the five remaining may be used as usual. When not in use it may be removed, thus leaving a regular screw machine for general lathe work. The main spindle through which the rod of stock is received

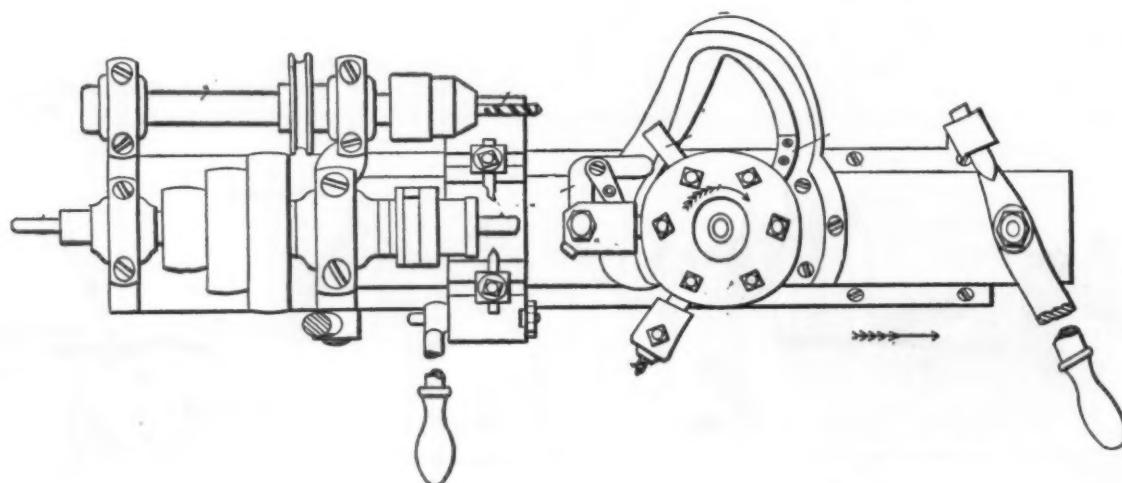
The machine shown takes stock up to $1\frac{1}{4}$ inches in diameter through the spindle and has a milling stroke of $10\frac{1}{2}$ inches. The tools shown in the turret are for making rough $\frac{1}{4}$ -inch studs for locomotive work and is the smallest one out of six built by this company for the new railroad shops at Altoona, Pa. We present drawings of specimens of work done by this machine at one operation.

A car-axle trust is said to have been formed at Cleveland, Ohio, last week. The organization is called the United Car Axle Manufacturers' Association, but their pro-

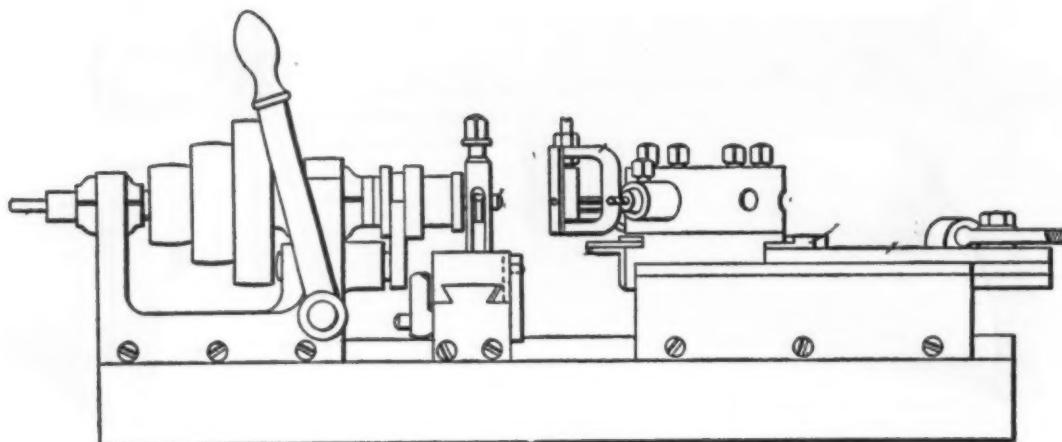
Spirally Welded Steel Tubes.*

BY W. S. MALLORY, CHICAGO.

Having lately had opportunity of carefully examining the processes and products of a new industry established in East Orange, N. J., which, in my judgment, is destined to exert a most important influence upon the engineering progress of the country for many years to come, I am impressed with the belief that some information concerning it will be of interest to the members of the association. I refer to the manufacture of serviceable pressure-pipes of great strength from strips of steel



Plan.—Screw Machine.



Front Elevation.

SCREW MACHINE FOR FINISHING BOTH ENDS OF WORK WITHOUT SECOND HANDLING.

is provided with an automatic chuck on the front end and a revolving roller-feed on the other. The roller-feed is so constructed that it acts as a carrier or chuck for back end of rod. It will feed square, hexagon, round or any other shape of stock and any length. The lever for operating the automatic chuck and the roller-feed is located at the front end of head and is connected by a toggle-joint to the automatic chuck. These machines are made in ten sizes, the largest of which, weighing 6500 pounds, takes stock up to $3\frac{1}{2}$ inches in diameter through the spindle. The smallest, weighing 550 pounds, will take work from $\frac{1}{2}$ inch down to $\frac{1}{16}$ inch in diameter.

The roller-feed and automatic chuck, second-end attachment and the chasing apparatus are all extra attachments, one or all of which can be furnished with the ten regular sizes.

ceedings were not made public. A Cleveland paper says: "Among the prominent delegates were T. F. Judge, of the Erie, Pa., Car Works, George W. Burnham, of the Indianapolis Car Works, and J. T. Ely, of the Cleveland City Iron and Forge Works. The intention is to have the trust in working order by the 1st of January. One of the delegates, when approached, would neither affirm nor deny the report. Another meeting will be held in the near future, when the matter will be further discussed."

The new freight boat, Express, built by the Harlan & Hollingsworth Company to transport cars for the Pennsylvania Railroad between Jersey City and Wilson's Point, near Bridgeport, Conn., steamed 35 miles in 1 hour and 56 minutes. She has four boilers and independent engines.

spirally wound and hammer-welded. The process is wholly automatic and the machinery employed is most ingenious. Considering the number and variety of the operations performed by the machine—feeding in the skelp, bending it, heating it along both edges, hammer-welding the seam and passing the finished pipe forward so that its increasing weight shall not overtax the feed devices—it is a marvel of simplicity. A machine which will make 24-inch pipe occupies a space about 3 feet by 6 feet and is run by a 4-inch belt. To watch it in operation and see cold steel entering the machine in a flat ribbon and black pipe, perfectly welded, straight, smooth and beautiful, passing out a few inches further along, is

* Read at the tenth annual meeting (second session) of the United States Association of Charcoal Iron Workers, Duluth, September 23.

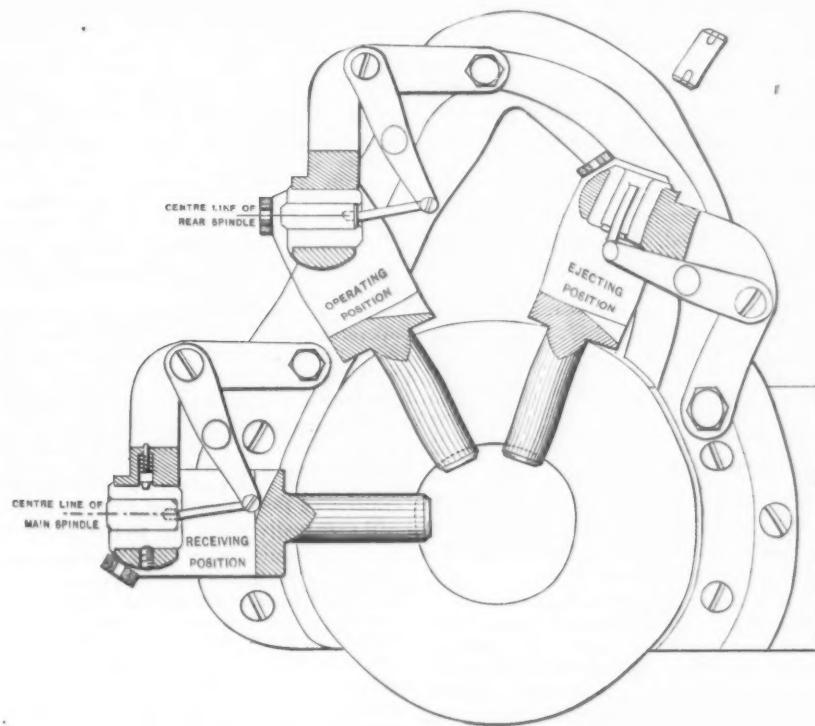
indeed a surprise, especially when it is realized that within this few inches the pipe has been formed, the metal brought to the welding heat, the welding accomplished and the seam cooled by water.

The steel used in this industry is of very mild quality, and, from its chemical composition, weldable. It is made in

rolls which are geared together and are adjustable to any thickness of skelp employed. As the skelp enters it passes over the face of a stationary water-cooled anvil—or, more properly, anvil-horn—which, being smaller than the pipe, does not in any respect serve as a mandril. The face of this anvil is slightly curved, and the

on the anvil. The feed is variable at the pleasure of the operative and may be reduced or increased as the color at the point of welding renders necessary. He has his gas and blast perfectly under control and can vary their proportions as he finds necessary. With this exception the machine is entirely automatic in operation. The emerging pipe is sustained on supports with trailing anti-friction wheels which accommodate themselves to its double motion, and when finished it requires only to have its ends cut square and its couplings applied. Any length of pipe can be made which it is possible to handle when finished. The longest piece thus far made was 57 feet in length, 10 inches in diameter. It had to be cut up for shipment.

These tubes combine lightness with strength in a degree never before attained in pipe manufacture. The reason for this is obvious when it is remembered that the weld is a spiral re-enforcement. A circumferential strain, which exerts itself to open a longitudinal weld, only closes a spiral seam the more tightly. It is impossible by any pressure yet applied to open a spiral seam; and even if the welding is imperfect, as sometimes happens



Attachment for Threading, Slotting and Milling the Second End of Work.

the Bessemer converter and gives the following average analysis:

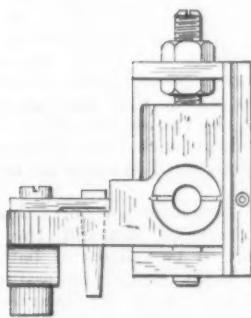
Carbon.....	.07
Silicon.....	.003
Sulphur.....	.048
Manganese.....	.318
Phosphorus.....	.120

This material has an average elastic limit of 43,000 pounds and an ultimate strength of 63,000 pounds. It welds perfectly. For the purposes of this industry it is rolled in strips of the greatest practicable length, 12 or 18 inches wide. These strips average 20 feet in length. To pre-

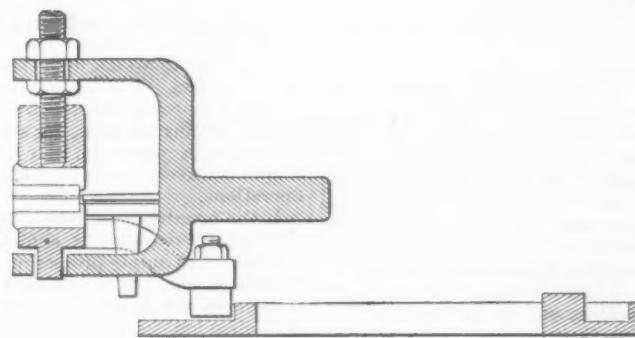
side next the furnace, which is always exposed to intense heat, is protected by a face of refractory material conforming to the curvature of the pipe. The formation of the pipe is effected by a device known as the crimper, which is an oscillating curved jaw, acting against the face of the anvil and bending to the required radius the steel interposed between them. After receiving its bend the steel is kept in place by the former-block, lined with rolls, and it is there kept from springing out of shape until it is welded.

Specimens of Work Done at One Operation.

with too rapid feeding, the effect of internal pressure is to close the leak and not to open it. One is naturally surprised to learn that a pipe which will show a leak at 20 pounds of water-pressure becomes as tight as a bottle under a pressure of 100 pounds, and stays so until the ultimate strength of the metal is reached. Yet such



Front View Turret Chuck.



Side View.

pare them for use in the production of long tubes, the ends of these strips are lapped and welded together by machinery adapted to the purpose.

The end of a strip thus prepared is secured to the guide table of the pipe machine, which is set at the angle due to the relation between the width of the skelp used and the diameter of the pipe to be made. It enters flat, impelled by feed-

The welding heat is supplied by blow-pipes of water-gas and air contained in a small furnace scarcely more than 1 foot square. One heats the upper or entering skelp, and the other the lower skelp or that portion which has already taken the form of the pipe. The feed brings these edges together as the pipe rotates and grows, and a rapid-striking light hammer welds the two edges together as they meet

is the fact. The explanation is found by a simple experiment. With a strip of paper wound spirally and pinched tight at one end, a light pressure of the breath, applied with the mouth at the open end, will find easy escape, but as the pressure increases the leak closes, and the pressure may then be increased until the tube bursts. The harder you blow the tighter it becomes. The tendency of the spiral to

unwind has produced such close contact at the seams that a leak is impossible, even though tightness depends solely upon the mere contact of paper surfaces. As the rule, however, the spiral welds are perfect, and as soon as the ends of the tubes are squared they are tested to 300 pounds and passed into the finishing-shop, where they are flanged or otherwise prepared for use.

The actual strength of this pipe is never indicated by the tests applied at the mill, unless it is desired to surprise a visitor. They are then tested under pressures ranging from 500 to 1000 pounds per square inch, according to weight and diameter. A pipe has never been burst by any means yet available in testing it. As indicating the strength of these tubes, I take the following illustrations at random from the test records:

Diameter. Inches.	Weight per foot. Pounds.	Safe work- ing pressure. Pounds per sq. in.	Ultimate strength. Pounds per sq. in.
6	6.22	866	1,408
12	15.41	727	1,181
16	26.19	670	1,088
20	32.25	536	871
24	38.78	446	726

The novel industry which I have thus briefly described places a new material at the command of the engineer, which is already in such demand as to embarrass the makers in filling orders. Its principal uses thus far have been for natural-gas lines, conduits for compressed air, pump columns and discharge-pipes in mine drainage, steam, blast and gas conduits in metallurgical works and water-mains. The couplings are as practical as the pipe. Those most used are the flange, and the hub and spigot made to the American water-works standard for cast-iron pipe. All forms of flanged or hubbed specials are used as with other pipe.

The Cost of English Bessemer Pig.

The *Iron and Steel Trades Journal* has published the following estimates of cost of making Bessemer pig-iron before the rise in raw materials and at the present time:

	£.	s.	d.	£.	s.	d.
36 cwt. ore (@ 10s.)	1	14	1	(12s.)	1	8
21 cwt. coke (@ 28s.)	1	9	5	(18s.)	0	18
Limestone	0	3	6	0	2	11
Wages, salaries, charges, supplies and repairs	0	8	0	0	8	0
Totals..	£3	15	1	£2	9	1

Our contemporary adds:

"These figures may be criticised, but they approximate pretty nearly to what the actual cost must be, supposing that fuel and ores are purchased at the market prices ruling to-day. These figures seem to show that were it not that iron smelters are receiving materials, &c., under contracts effected at lower rates than those now ruling, they would hardly be able to make iron at the "high prices" at which it is now selling, and if fuel and ore are to remain at their present price pig-iron must of necessity be worth more money. The figures quoted apply specially to hematite-iron, but if a comparison of costs and selling prices "now" and "then" were made in other iron-producing districts, a somewhat similar state of affairs would be manifest. The advance in iron is principally appropriated by the iron and coal mine owners, the coke manufacturers and the men employed in mining and smelting; and it seems that at present neither the iron smelters nor the iron and steel manufacturers have participated properly in the improvement in values."

OUR NAVY.

SECRETARY TRACY'S REPORT.

The Secretary of the Navy, Benjamin F. Tracy, has submitted a report to Congress which contains the following data:

The effective force of the United States Navy, when all the ships now authorized are completed, excluding those which by the process of decay and the operation of law will by that date have been condemned, will comprise 11 armored vessels, of which only 3 are designed for fighting at sea, and 31 unarmored vessels, making a total of 42.

The following statement shows the number of war-vessels on the effective list of the principal foreign powers, built, building, or projected, at the present time, and exclusive of sailing and practice ships:

Country.	Armored.	Unarmored.	Total.
England	76	291	367
France	57	203	260
Russia	49	119	168
Germany	40	65	105
Holland	24	70	94
Spain	12	78	90
Italy	19	67	86
Turkey	15	66	81
China	7	66	73
Sweden and Norway	20	44	64
Austria	12	44	56

The table shows that even when the present building programme is completed the United States cannot take rank as a naval power.

A FIGHTING FORCE WANTED.

The defense of the United States absolutely requires the creation of a fighting force. So far the increase has been mainly in the direction of unarmored cruisers. The vessels, while useful in deterring commercial States from aggression and as an auxiliary to secure celerity and efficiency in larger operations, do not constitute a fighting force, even when it is intended exclusively for defense. To meet the attacks of iron-clads, iron-clads are indispensable. To carry on even a defensive war with any hope of success we must have armored battle-ships. The capture or destruction of two or three dozen or two or three score of merchant-vessels is not going to prevent a fleet of iron-clads from shelling our cities or exacting as the price of exemption a contribution that would pay for their lost merchantmen ten times over. We must do more than this. We must have the force to raise blockades, which are almost as disastrous to commercial cities as bombardment. We must have a fleet of battle-ships that will beat off the enemy's fleet on its approach, for it is not to be tolerated that the United States, with its population, its revenue and its trade, is to submit to attack upon the threshold of its harbors. Finally, we must be able to divert an enemy's force from our coast by threatening his own, for a war, though defensive in principle, may be conducted most effectively by being offensive in its operations.

If the country is to have a navy at all it should have one that is sufficient for the complete and ample protection of its coast in time of war. If we are to stop short of this we might better stop where we are and abandon all claim to influence and control upon the sea. It is idle to spend our money in building small, slow-going steamers that are unnecessary in peace and useless for war. It is little better than a repetition of the mistaken policy that prevailed in our early history of building gun-boats that were laid up or sold as soon as war broke out. The country needs a navy that will exempt it from war, but the only navy that will accomplish this is a navy that can wage war.

THE NEW CRUISERS.

The new cruisers are eight in number, the Chicago, Boston, Atlanta and Dol-

phin, contracted for in 1883, and the Baltimore, Charleston, Yorktown and Petrel, contracted for in 1886 and 1887.

At the very time when the first cruisers were being designed the Department took steps to supply its want of experience by the systematic acquisition of information as to naval progress abroad. The establishment of the office of naval intelligence and the assignment of naval attachés to duty in Europe, both of which measures date from 1882, have been of incalculable assistance in the work of reconstruction, and it is proper to refer especially to the untiring and successful efforts of Commander F. E. Chadwick, the first attaché sent out, whose extraordinary ability and judgment during six years of difficult service in England and on the Continent have had a lasting influence upon naval development in this country. The results subsequently obtained have shown the wisdom of the policy adopted at the outset.

The net results of the Department's operations for the last seven years are more than satisfactory. The assaults made, with more audacity than judgment, upon the four experimental cruisers of 1882 have been met successfully by the performance of the vessels, and all doubts of their efficiency, if such doubts ever really existed, are laid at rest forever; while the four cruisers of 1886, assuming that the Petrel will eventually come up to the mark, in their advance over their predecessors prove that both designers and constructors have kept themselves abreast of the extraordinary development in ship-building since the earlier cruisers were laid down, and have taken full advantage of the information and experience which they were enabled to acquire through the measures adopted at that time by the Navy Department.

ARMORED BATTLE-SHIPS ADVOCATED.

To stop now in the work of reconstruction is to abandon everything we have gained. We have proved that at a time when warship construction had seemed almost a lost art in this country, American mechanics could create it anew and place the United States where it was 70 years ago, when the vessels of its navy were the best of their class afloat. We have fostered and developed a branch of industry in America which may if kept up attract to itself no inconsiderable share of the profits that now go to ship-builders abroad. We have secured for our navy a certain number of excellent and useful vessels of the unprotected cruiser type at a fair and reasonable cost. We have thus laid a solid foundation. But we must not for a moment deceive ourselves by supposing that we have an effective navy. We have two distinct and widely separated ocean frontiers to protect, and there is only one way in which they can be protected—namely, by two separate fleets of armored battle-ships, with coast-defense ships suitably distributed to cover the most exposed localities.

The necessities of our vulnerable position, therefore, demand the immediate creation of two fleets of battle-ships, of which eight should be assigned to the Pacific and 12 to the Atlantic and Gulf. They must be the best of their class in four leading characteristics—armament, armor, structural strength and speed. The last is nearly as essential to the battle-ship as it is to the cruiser. It may safely be assumed that, other things being equal, the battle-ship of the highest speed will as a rule be the victor in action, for she can choose her position and keep the enemy at a disadvantage. Not only must the speed of our battle-ships be high but it must be uniformly high, for the speed of the fleet is regulated by that of the slowest vessel. In addition to the battle-ships, the situation of the country requires

at least 20 vessels for coast and harbor defense. These vessels, although restricted in their range of effectiveness, are necessary components of a naval force which has a sea-coast to defend. Their employment as floating fortresses requires that they should have a powerful battery and the heaviest of armor, combined with moderate draft. At the present time eight vessels of this type are under construction, five of which are reconstructed monitors.

The one problem now before the Government, in the matter of a naval policy, is to get these 40 vessels built at the earliest possible moment. The steps necessary to their completion—namely, legislation, design and construction—cannot take less than five years in the case of each one. Unless the existing yards, public and private, are enlarged and restocked with plant, not more than eight could be built at one time, and the construction of the others would have to wait for the launching of the first. Using the utmost promptness, the ships most essential to efficient protection could not be supplied in less than 12 or 15 years. It is therefore recommended that the construction of eight armored vessels be authorized at the coming session, and that they be of the type of battle-ships rather than of coast-defense ships; the former being more generally serviceable, and there being only three of them now in process of construction as against eight of the latter.

In reference to fast cruisers, all modern experience goes to show that they are essential adjuncts of an armored fleet, and the proportion of three cruisers to one battle-ship is believed to be sound and reasonable. This would make the future navy consist of 20 battle-ships, 20 coast-defense ships and 60 cruisers, or 100 vessels in all, which is believed to be a moderate estimate of the proper strength of the fleet. Of the 60 cruisers required 31 are now built or authorized. For an increase in the number of cruisers, considered simply as auxiliaries to the fighting force of battle-ships, we may wisely wait until the latter are in process of construction.

THE BRITISH IDEA INDORSED.

It is a matter for serious consideration whether steps may not be taken toward the creation of such a fleet of specially-adapted steamers of American nationality, owned by American merchants, carrying the American flag and capable, under well-defined conditions, of temporary incorporation in the American Navy. The advantages of such an arrangement, which enlarges the merchant marine and makes it at the same time self-protecting, are overwhelmingly great. The difficulty is that American capital will not be drawn into the enterprise unless it can be sure of specific compensation for the concessions which it makes to the Government—1, in the adaptation of its vessels to the latter's needs, and, 2, in the surrender of a privilege to use them when the exigency arises.

FAST MERCHANTMEN SUGGESTED

Our deficiency should be supplied either by a line of fast merchantmen, constructed with special reference to use in time of war, which will enable the Government to avail itself of their services at critical moments, or we should build a fleet of at least five first-class cruisers of the very highest rate of speed, certainly not less than 23 knots. The displacement of these vessels should not be less than 4000 tons. Even such a fleet will not supply the want of swift merchant steamers for coaling and transport service. Colliers and transports must alike be fast, for they cannot fight; and the collier can take no chances of capture, for she carries the life of the fleet.

In determining the size of the smaller type of cruisers, one point is settled: All steel cruisers must be large enough to admit of a double bottom. A vessel like

the Yorktown, which has but $\frac{1}{4}$ -inch steel on her bottom, could hardly escape sinking if she touched a rock, no matter how lightly. Such a ship must not strike. She cannot run any of the risks which the old-fashioned ships used to run every day with comparative safety, for a steel bottom will be penetrated where a wooden one would be merely scarred. Besides the Yorktown we have the Concord, the Bennington and the three 2000-ton cruisers (Nos. 9, 10 and 11) which are marked by this defect. It is not well to add to the number.

In reference to the gun-boat class, any large increase in it must be condemned. This class is now represented by the Petrel and the two 1000-ton vessels (gun-boats Nos. 5 and 6). To make any considerable addition to it is consuming the revenues of the Government without any proportionate benefit. It is chasing the shadow and losing the substance. Such vessels add nothing to the real strength of a naval force. A cruiser to be useful must be fast enough to overtake any merchantman and to escape from any more powerful ship-of-war. These vessels have neither the strength to fight nor the speed to run away. A limited number of 1000-ton vessels can be utilized in certain special kinds of service on foreign stations, and for this particular purpose it is recommended that three such vessels be constructed. Any larger increase at the present time would be injudicious and wasteful.

TORPEDO-BOATS.

Apart from the want of battle-ships, the most marked defect of the present fleet is in torpedo-boats. The number of these boats owned by 15 foreign States is as follows:

Country.	Torpedo-boats	Country.	Torpedo-boats
England	207	China	26
France	161	Denmark	22
Russia	138	Japan	21
Italy	128	Sweden and Norway	19
Germany	98	Holland	16
Austria	60	Spain	17
Greece	51	Brazil	15
Turkey	29		

The United States has one such boat under construction. This branch of defense cannot safely be neglected any longer. It is high time that steps should be taken to supply these essential constituents of a naval force. I therefore recommend that the construction of at least five torpedo-boats of the first and second classes, in suitable proportions, be authorized as a beginning at the coming session of Congress.

NAVY-YARDS.

On the broad question which arose in the case of the two 3000-ton cruisers of the comparative advantages of the two systems of naval construction, the first in the Government yards and the second by contract with private firms, the Department is firmly of the opinion that the latter is the best method. It may reasonably be expected that as ship-building in America is gradually improved and cheapened, additional private business will be attracted to these growing establishments, until in time the world's market for ships will be divided between this country and Europe. All these advantages are lost by policy that confines the construction of vessels exclusively to the navy-yards. Still, it is advisable that the navy should build some of its ships. While a great majority of our new vessels should be constructed by private builders, the Government yards should also be utilized to a limited extent.

The only naval stations now in use as construction-yards are Brooklyn, Norfolk, Mare Island and Portsmouth—the last for wooden vessels only. The other navy-yards were closed, as far as construction and repair were concerned, by order of the Secretary, June 23, 1883, under the provisions of the act of August 5, 1882. The Department having taken this action

in pursuance of law, the yards referred to must remain closed until the law shall re-open them. At present there are building sites for eight ships at Brooklyn and Norfolk and for three at Mare Island. Of the former five are now occupied. Provision has been made for supplying these yards with a working plant which is now in part delivered. A further appropriation of \$50,000 is required for tools at Brooklyn. The three construction-yards will then have a working outfit. If additional facilities are needed to hasten the construction of the navy they may be provided either at Boston or League Island, each of which presents considerable advantages of situation. At the Boston Navy Yard a modern plant for building steel vessels sufficient for work on an extensive scale can be set up at moderate cost. The League Island yard has remained since its transfer to the Navy Department largely in an undeveloped state. It has fresh water in which to lay up iron and steel ships. In this last respect it stands alone, and this consideration is of itself sufficient to warrant its gradual improvement. The yard should therefore be put in such order as to make it available at least for purposes of repair.

The suggestion that the naval station at Port Royal, S. C., be provided with a dry-dock and other necessary facilities for docking vessels is heartily approved. The objects of a navy-yard are threefold: it may be a construction-yard, a repair-yard, or a naval station, or all combined. For a new construction-yard the Navy Department has no use. A repair-yard in the Northwest will be necessary at some future time, and the time is not very far off. Vessels in those waters must not be under the necessity of going 2000 miles to San Francisco and back to clean their bottoms or to have slight repairs made. The site for such a yard is unquestionably in Puget Sound, which has all the advantages of favorable position, great extent of navigable waters, freedom from dangers and from obstructions by ice, a temperate climate, a promise of extraordinary development, and great natural resources in coal, iron and timber. A naval station there is needed now.

The number of high-power steel cannon for the navy completed to date includes 2 5-inch, 48 6-inch, 8 8-inch and 3 10-inch. During the past year 21 6-inch guns have been finished at the Washington Navy Yard, 3 at the West Point Foundry and 3 at the South Boston Iron Works. Besides these, 9 guns are in course of construction.

THE APPROPRIATIONS NEEDED.

The following is an exhibit of the estimates of the Department proper and the several bureaus:

Department proper:	
Pay of the navy	\$7,656,312.00
Pay, miscellaneous	240,000.00
Contingent, navy	7,000.00
	\$7,903,312.00
Bureau of Yards and Docks	1,796,896.32
Bureau of Navigation:	
Proper	\$104,900.00
Naval Academy	281,617.45
	446,517.45
Bureau of Equipment and Recruiting	1,128,625.00
Bureau of Ordnance:	
Proper	\$279,224.00
Increase of the navy	3,971,500.00
Gun-plant, Washington Navy Yard	145,000.00
Submarine torpedo-boat	150,000.00
	4,545,724.00
Bureau of Construction and Repair:	
Proper	\$1,194,972.50
Increase of navy	4,000,000.00
	5,194,972.50
Bureau of Steam Engineering:	
Proper	\$1,000,070.00
Increase of navy	1,120,070.00
Bureau of Provisions and Clothing	1,350,392.53
Bureau of Medicine and Surgery	159,500.00
Marine Corps:	
Pay department	\$697,402.27
Quartermaster's department	255,811.72
	953,303.99
Total	\$25,599,259.79

The Secretary also deals with the creation of an efficient force of seamen and of a naval reserve.

Pineville Coke.

John Fulton, mining engineer, has made the following report on a sample of coke from the Cumberland Valley Colliery Company, Pineville, Ky.:

Assuming that this sample of your coke, submitted for chemical and physical examination, is a fair average of its quality, I have had seven physical tests made, giving the average of the seven in the accompanying table:

	Standard Coke.	Locality. Connellsville.
Grammes in	Dry....	15.47
One cubic inch.	Wet....	23.67
Pounds in	Dry....	58.98
One cubic foot	Wet....	87.34
Percentage	Coke.....	49.96
by volume.	Cells.....	50.04
Compressive strength per inch, $\frac{1}{4}$.		49.68
Ultimate strength.....	301.	227.
Height of furnace charge, supported without crushing.....	120.	91.
Hardness.....	3.5	3.0
Specific gravity.....	1.89	1.71
Chemical analysis		
Fixed carbon.....	87.46	94.66
Moisture.....	0.49	1.14
Ash.....	11.32	3.78
Sulphur.....	0.69	0.59
Phosphorus.....	0.029	0.007
Volatile matter.....	0.011	0.041

In this table the Connellsburg coke has been made the standard, so as to afford a means of comparison between this and other cokes. In general principles coke for metallurgical uses should possess hardness of body with well-developed cell structure, so as to insure exemption from combustion in the upper region of a blast-furnace and to afford the utmost calorific energy in the lower region of the furnace. Hardness of body in coke prevents its dissolution by the furnace gases in a section of the furnace when it is not only a waste of fuel, but when it disturbs the orderly working of the furnace. The large cell development in coke assures calorific energy in its combustion.

The coke you have submitted from your Pineville works shows that it has been carefully and intelligently treated in the coke-oven. There are no indications to show where an improvement could be suggested in this respect. The coke has the usual slender columnar structure somewhat peculiar to Kentucky cokes. It will be seen on the table that the cellular structure of this coke is somewhat below the standard Connellsburg. This slight physical defect is compensated in a great measure for blast-furnace use by the slender finger structure of the coke as it comes from the coke-ovens. Its burden-bearing qualities are equal to the highest blast-furnaces now in use or likely to be attempted for some time to come. The hardness of this coke is so near that of the Connellsburg standard that it is not necessary to draw any special distinction. The chemical analysis shows that it is a much purer fuel than that of the Connellsburg standard. The ash is remarkably low—only one-third of the volume found in the Connellsburg. As a clean fuel it has few, if any, superiors. It will also be noted the exceptionally low percentage of the element of phosphorus in this coke, which gives it special adaptability for smelting Bessemer pig-iron. The sulphur is low—under that of the standard. It will be found a very superior fuel for blast-furnace purposes, for smelting iron in cupolas and for all metallurgical purposes in which coke is used as a fuel.

It is estimated in Cleveland that about 400,000 tons of Duluth ore, to come from the Vermilion next season, has already been

covered at a freight rate of \$1.35 a ton. The figures do not come from the local representatives of the Minnesota Iron Company, but are based on a knowledge of the work of the vessel brokers during the last week.

Steam-Engine Valve.

The objects aimed at in designing the valve of which we present drawings were to provide for a partial steam balance for slide-valve and also to lessen the distance between the valve-seat and the bore of the cylinder, whereby the steam passages leading from the steam-chest to the cylinder are reduced to a minimum length. The valve-seat is provided with transverse

may be distributed in its effects of wear and friction about evenly over the entire valve face. As an additional improvement a transverse recess is provided in the cylinder casting centrally between the valve-seat ports and extending beyond the shallow chamber in order to admit steam more freely beneath the valve.

A tube extends through the chamber of the valve, fitted steam-tight at its ends in the end walls of the valve. This tube gives passage to the valve-stem, upon which the valve is adjustably secured by nuts applied to the stem, one at each end of the valve. The tube is made of larger interior diameter than the stem, for the purpose of allowing a vertical movement of the valve without a corresponding movement of the stem, as may be required by

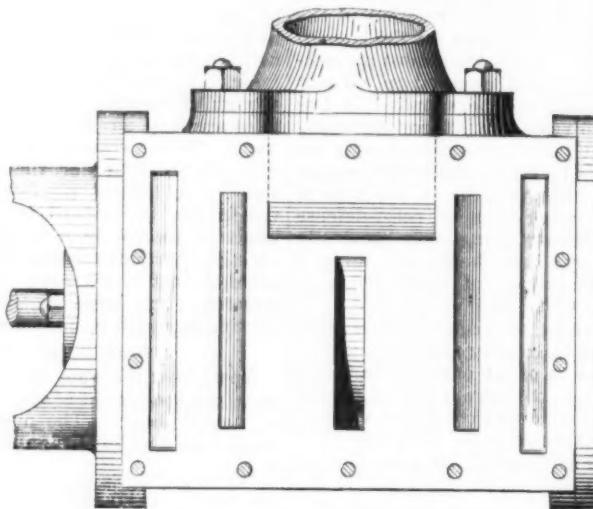


Fig. 1.—Plan of Valve-Seat.

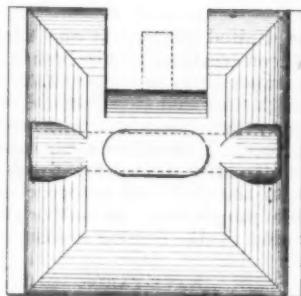


Fig. 2.—Top View of Slide-Valve.

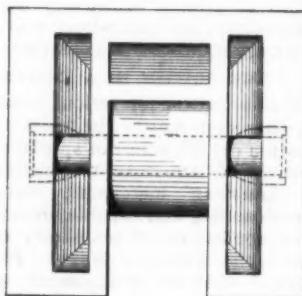


Fig. 3.—View of Sliding Face of Valve.

THE BULLOCK STEAM-ENGINE VALVE.

steam-ports in the usual positions and with a longitudinally arranged exhaust-port placed at one side of the valve-seat as shown in Figs. 1 and 4. The slide-valve is formed with exhaust-ports in proper positions to work in connection with the ports in the valve-seat, and these ports communicate with an interior chamber in the valve having a discharge opening or port arranged longitudinally of the valve or at right angles with the ports and at one side of the valve in position to coincide with the corresponding port in the valve-seat. The valve has a passage through its side opposite the port leading to its chamber, as seen in Figs. 2, 3 and 4, and this passage is extended in the under face of the valve to form a shallow chamber. By means of this chamber steam is admitted beneath the valve to the extent of the area of the chamber and the pressure on the top of the valve is thereby reduced. The chamber is located about in the center of the valve, in order that the relief afforded

the wear of the valve face and seat or by the presence of water in the cylinder in starting the engine, which may cause the valve to rise clear of its seat to give escape to the water.

On the top of the valve is provided an oblong plane surface (Figs. 2, 4 and 5) finished parallel with the valve-face. Upon this surface bears a button, laterally confined in a socket in the under surface of the top plate of the valve-chest, and between the button and the top plate of the chest is placed a spring (Figs. 4 and 5) which exerts its force to press the valve against its seat.

In the construction of the valve, as shown, the ports of the cylinder may be direct, or as nearly direct as desired, in their course through the cylinder wall, and the central chamber heretofore provided in the cylinder casting for the exhaust over the highest line of the cylinder bore is dispensed with. As a result the cylinder passages are shortened both by their more

direct course and by the thinner body of metal required between the cylinder bore and the valve-seat. This valve has been patented by M. C. Bullock, president of the M. C. Bullock Mfg. Company, of Chicago, Ill.

Another Blow at Trusts.

The Cotton Seed Trust has been abolished by the voluntary action of the holders of its certificates, because it did

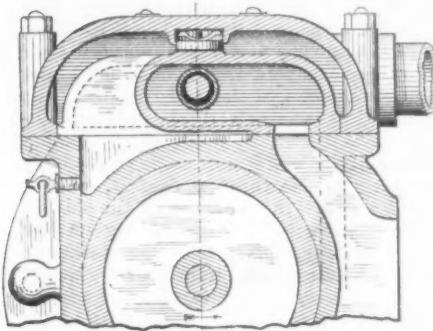


Fig. 4.—Central Cross-Section of Cylinder.

not fulfill the promise of its organization. The Sugar Trust has been declared to be illegal by the Supreme Court of this city, and only a decision of the Court of Appeals stands between it and dissolution. The State of Missouri has passed a sweeping law against all trusts. Last week Judge Magruder, of the Supreme Court of Illinois, declared that the Chicago Gas Trust is illegal in so far as it owns the stocks of the companies forming the combination. Thus one after another the "trusts" are meeting with disaster. How their certificates are regarded in Wall street can best be indicated by a simple exhibit of prices. At one time this year cotton seed trusts were selling at 61½, lead trusts at 35, sugar trusts at 125 and

implication therefrom that the power to purchase stock in other gas companies should also exist.

"The Chicago Trust Company has purchased and now holds a majority of all the shares of stock of the Chicago companies. One of the results of such holdings is that the Trust Company can control the four other companies. The purpose for which a corporation is formed, under the general incorporation act, must be a lawful purpose. So far as the trust was organized with the object of purchasing and holding all the shares of the capital stock of any gas company in Chicago or Illinois, it was not organized for a lawful purpose, and all acts done by it toward the accomplishment of such object are illegal and void. Whatever tends to prevent competition between those engaged in a public employment or business impressed with a public character is opposed to public policy, and therefore unlawful. Whatever tends to create a monopoly is unlawful, as being contrary to public policy." The Judge gives extensive quotations and numerous citations from text writers and reports to show the unlawful and void character of monopolies, and says: "But of what avail is it that any number of gas companies may be formed if a giant trust company can be clothed with the power of buying up and holding the stock and property of such companies? To create one corporation for the express purpose of enabling it to control all the corporations engaged in a certain kind of business, and particularly a business of a public character, is not only opposed to the public policy of the State, but is in contravention of the spirit, if not the letter, of the Constitution. That the exercise of power attempted to be conferred upon the trust must result in the creation of a monopoly results from the very nature of the power itself."

Sheffield, Ala., celebrated Thanksgiving Day by sending by the river route to St. Louis 300 tons of pig-iron. The shipment was made by the steamer City of Savan-

nah, a St. Louis boat, recently built especially for this trade, and was the first one ever sent by river. It was the virtual opening of a new route and a matter of great consequence to Sheffield, and proportionately to the entire mineral district of Alabama. The difference in freight in favor of river transportation is fully \$1 per ton, and means to the furnaces of this district an aggregate saving of many thousands of dollars per day. Quite a demonstration was made at the departure of the boat. Contracts for large future shipments of Sheffield iron have been made and large

The Record of the Spring Lake Furnace.

Joseph C. Ford, manager of the Spring Lake Furnace, at Fruitport, Mich., has sent to the "Journal" of the United States Charcoal Iron Workers the following data: The furnace, which is located near the eastern shore of Lake Michigan, about ten miles from the city of Grand Haven, with rail and water communication, was constructed in 1879-80, first blown in March 4, 1880, and is now on the sixth blast. From the time of the blowing-in of the furnace to September 7, 1889, a period of 3471 days, it has run 3205 days (about 8½ years). The length of the various blasts and the results obtained in each are as follows:

	Length of campaign.			Tons of pig-iron per day.	Bushels of charcoal per ton of iron.
	Total days.	Stops.	Net days.		
1st blast...	677	7	670	29,040	63
2d blast...	799	7	792	33,124	62
3d blast...	331	11	320	15,279	48
4th blast...	510	14	496	26,868	54
5th blast...	586	10	576	29,237	51
6th blast...	361	10	351	30,451	58
Totals...	3,264	50	3,205	153,900	48

The iron is weighed out at 2260 pounds to the ton. The charcoal is charged to furnace by measure, 2748 cubic inches to the bushel, the weight averaging 20 pounds. It is made from one-third hemlock, black ash, elm and soft maple, and two-thirds from beech, sugar maple, oak and birch woods, in brick-kilns owned by the company, 20 of which are of 80 cords capacity and 30 of 55 cords capacity each.

The furnace is 45 feet high, bosh 10 feet 6 inches in diameter, with crucible 5 feet in diameter and bell 5 feet, equipped with Weimer charger and seal. It is blown by a Weimer engine, 60-inch air-cylinder, 4-foot stroke. Steam is supplied by two batteries of steel boilers (two boilers in each battery). The boilers are 30 feet long and 48 inches in diameter, one battery only being used at a time. The blast is heated by one 24-pipe Player and one 35-pipe Weimer suspended stove, the average temperature of the blast being 850°, as blown into furnace through four 3½-inch tuyeres.

The ore used is brought from Lake Superior mines by rail to Escanaba, thence by vessel to Fruitport, and discharged directly into the stock-house adjoining the furnace. The limestone used for flux is brought from Kelley's Island, Lake Erie, by vessel. The fuel supply is obtained at and near to the furnace, along the line of Chicago and West Michigan Railway, 40 miles being the longest haul of charcoal by cars. The average yield of the ore mixture varies between 58 and 61 per cent.

On the 28th ult. the monument erected to the memory of the late Thomas A. Armstrong, formerly one of the editors and publishers of the *National Labor Tribune*, of Pittsburgh, was unveiled. It is situated in the public parks in Allegheny City, Pa., and is a beautiful piece of workmanship. All the labor organizations in Allegheny County were represented in a parade that took place previous to the dedication of the monument. More than 12,000 men were in line.

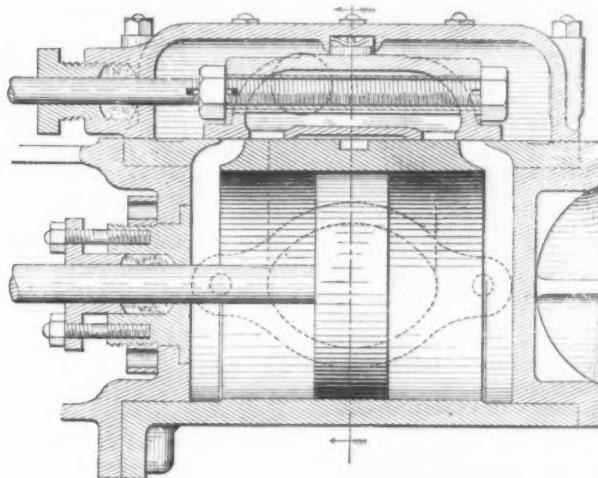


Fig. 5.—Central Longitudinal Section of Cylinder, Steam-Chest and Valve.

Chicago gas trusts at 61½. They sold at 29½, 18½, 65½ and 39, respectively. Public opinion has put the stamp of its disapproval on these combinations. Justice Magruder in his opinion said:

"The validity of the company is acknowledged and the right to acquire works for the manufacture and sale of gas or electricity conceded, but the authority of the trust to purchase and hold and sell the capital stock of any company is denied. It is held that where a charter confers the power to operate works for the manufacture and sale of gas, it is not a necessary

annah, a St. Louis boat, recently built especially for this trade, and was the first one ever sent by river. It was the virtual opening of a new route and a matter of great consequence to Sheffield, and proportionately to the entire mineral district of Alabama. The difference in freight in favor of river transportation is fully \$1 per ton, and means to the furnaces of this district an aggregate saving of many thousands of dollars per day. Quite a demonstration was made at the departure of the boat. Contracts for large future shipments of Sheffield iron have been made and large

PROVIDENCE NOTES.

ARMINGTON & SIMS ENGINE.

The Armitage & Sims Engine Company recently made some economy tests on the 100 horse-power double-compound engines. The runs were of five hours each, condensing and non-condensing. The engine has cylinders 10 $\frac{1}{2}$ and 16 $\frac{1}{2}$ inches in diameter and 12 inches stroke. The speed on each trial was the same, 277 revolutions, and the initial steam-pressure was the same both days, 110 pounds. Running condensing with Worthington independent condenser the horse-power developed was 102.17; the total water used in the five hours, 9070 pounds; water used per hour, 1814 pounds, or 17.75 pounds of water per horse-power per hour. Running non-condensing with the same conditions the horse-power developed was 77.02; total water used, 9416 pounds; water used per hour, 1892 pounds, or 24.56 pounds of water per horse-power per hour. The utmost care was used in preparing the company's complete testing-room for the tests, and the results were very satisfactory to the builders. Some special engines for the United States cruiser Philadelphia are now in the testing-room. The cylinders of these naval engines are covered with a magnesia coating, which the Government prefers to asbestos, and cylinders and chests will be inclosed under one sheet of wood lagging, which has been substituted for the iron lagging strips. The little vertical double double-acting engine, especially designed at the request of the Navy Department for use where the space at disposal is very limited, takes up a width of 34 inches, length, with dynamos, 70 inches and height 52 inches. It has cylinders 5 inches in diameter by 3 inches stroke, and its speed fully loaded is 800 revolutions. This engine has been thoroughly tested, and on removing instantly the whole load the speed was increased but five revolutions, or a variation of but $\frac{1}{2}$ of 1 per cent.

IMPROVEMENTS IN HARRIS-CORLISS COMPOUNDS.

One of the large twin compound Harris-Corliess engines has just been delivered to the United States Cotton Company, Central Falls, R. I., and its duplicate is now being finished for the Cornell Mill at Fall River. These engines are of 1100 horse-power, each having cylinders 28 and 52 inches diameter by 72-inch stroke, a fly-wheel 28 feet in diameter with 8-foot face. The principal parts are of the most solid construction, as the following summary of their weights will show: Cylinders, 52 inches, 30,000 pounds; 28 inches, 18,000 pounds; each bed, 14,000 pounds; each pillar-block, 6500 pounds; jacketed receiver, 5800 pounds; air-pump and condenser, 11,000 pounds; shaft and centers, 32,000 pounds; 12-wheel arms, each 1500 pounds; 12-wheel segments, 4200 pounds. The total weight resting on the pillar-blocks is thus about 50 tons. The connecting rods are each 18 feet long, 7 $\frac{1}{2}$ inches in diameter in middle section and weigh 2450 pounds each. These engines serve to illustrate the most recent development of the Harris Works as applied to the compound engines, especially in the improved cross-head, the new style of releasing gear for steam-valves, the receiver between the high and low pressure cylinders and the new form of wheel. The old style of wheel had webbed arms and a hub with radiating webs which was quite difficult to mold. So closely is the running of fine engines figured nowadays that the amount of air entrained by these flanges on the arms is considered to have its influence upon the amount of fuel consumed. The flanges do not look very large when the engine is at rest, but when the wheel is running at 50 or 60 turns per minute they act as fans and carry enough air with them

to make a breeze strong enough to blow drops of oil out from under the sight-feed oil-cups on the pillar-blocks, necessitating the substitution of a glass shield on the open drip-cups. The wheel for the Cornell Mill engine is the fourth one made with oval arms. These arms are cast hollow and are much stronger than the old arms or than a solid arm of the same section. The hub is cast in an easy flowing curve, the only projections being offsets where they are necessary to give the bolts a square bearing. There is nothing about hub or arm to catch and carry the air. In the improved cross-head the piston-rod is attached by a screw and lock-nut. The hardened steel wrist-pin is located at the center so as to bring the thrust directly upon the guide. A wedge and adjustable screw furnish means of taking up the wear. For their receivers the Harris Works have adopted a device which has been recommended as effective and economical. It consists of a corrugated tube of $\frac{1}{8}$ -inch iron with the plain ends riveted to a cast-iron jacket. The corrugated tube allows of expansion and contraction and affords a larger heating-surface than a plain tube. The space between the tube and the cast-iron jacket is filled with live steam for drying and regenerating the steam passing between the cylinders. The water of condensation which would be pocketed in these corrugations is thus turned into steam again. Such big cylinders as these of 52 inches diameter are built up. The bore—the cylinder proper—is in one piece and the jacket another. The two are secured at the crank end of the cylinder, but are left an opportunity for some play in the stuffing-box at the head end as changes of temperature may alter the length with respect to the contiguous parts. This construction is held to preclude liability to accident from unequal expansions.

The new releasing-gear in these engines is an interesting piece of mechanism. A lever given a reciprocating motion by connection with the wrist-plate carries at its lower end a hook or bar upon which is a steel block, which engages a similar block upon the arm, which is keyed to the valve-stem. The first-mentioned hook is journaled in the end of the lever and would be free to hang downward were it not supported by a rod attached to its inner end, the other end of which is supported by a hardened steel roller in a cam-groove in a circular plate mounted upon the valve-stem bearing. If the cam-path were a smooth curve which would always keep the hook up to the block on the steam-valve lever, no cut-off would take place. But in this path is a sudden deviation from a concentric line which, when the roller strikes into it, forces the hook downward and out of engagement with that upon the valve-stem and the cut-off occurs. The cam-plate being rotated about its center by connection with the governor-rod, brings this point of change in the direction of the cam at the point necessary to effect the cut-off at the required time. The block upon the valve-stem is suspended upon a bolt and is free to move upward as the other block passes backward under it, falling by its own gravity into engagement. A recurve in the further end of the cam prevents an engagement in case of an accident to the governor and obviates the possibility of the engines racing. The whole arrangement is positive and its action is very satisfactory. The blocks are so offset that each may be changed so as to present eight different edges to wear. Separate eccentric are used for the steam and exhaust valves on the low-pressure side, and all oiling is by stationary sight-feed lubricators.

The Harris Works are running night and day with two sets of hands. Among the compounds now in hand are one for the

New Bedford Mfg. Company, 22 and 40 inches diameter by 48-inch stroke; one for the Anderson Cotton Mill, Anderson, S. C., 20 and 36 inches by 48-inch stroke, of about 600 horse-power, and one for the Bennett Mills, New Bedford, 24 and 44 inches by 60-inch stroke, of about 700 horse-power.

KILLED BY A PLANER.

N. A. Olson, an employee of Brown & Sharpe's, was instantly killed a few days ago by having his head cut open in a 3-foot planer about which he was working. The way in which the accident occurred is thought to be as follows: The belt-shifter which starts the planer-bed forward is in the form of a bent arm coming out under the bed-frame and about the height of the middle of a man's thigh. This belt-shifter is started by a very slight motion of the hand; much more easily by the body swaying to the right against it, so that the leg comes in contact with the shifter. Olson evidently had his casting on the bed and stopped very near the stationary tool extending down from above. He put his head down on a line with the casting and the tool to examine some part of the work, when his body, moving slightly to the right, pushed over the delicately poised belt-shifter, and the casting, moving forward on the bed at the rate of 25 feet a minute, shoved Olson's head under the tool, which cut through the flesh and bone as if they had been paper. Superintendent Viall said that in 25 years' experience in the shop there had never been a similar accident, and he never heard of a man being killed in that way upon a planer.

NOTES.

The employees in the machine-shop of the Rhode Island Locomotive Works are working until 10 o'clock every night.

The new machine-shop erected by Armitage & Sims is about completed, and the machinery is about to be put in.

The Providence Engine Company continue to work some of their help until 10 o'clock nightly. Since early last April they have been very busy.

CLIFFORD.

Some manufacturers in Pittsburgh have had enough of the trouble due to the uncertainty of the natural gas supply. Lindsay & McCutcheon, of the Star Iron Works, Allegheny, have rebuilt the heating-furnaces in connection with the 6-inch and 9-inch rolls, so as to use coal. Bricklayers are at work on another, and by next month all the heating-furnaces will be ready for coal. The men seemed to prefer the coal to the gas, claiming that when using coal they can reckon on their work, barring accidents to the machinery, whereas with the gas they are liable to be thrown idle at any time. The management of the Star Works say that during nine months of the past two years they have suffered from a scarcity of gas. Both puddling departments and 41 furnaces are still using gas, owing to the hours of work being changed. At Carnegie, Phipps & Co.'s Twenty-ninth street mills both the firm and the men are sufferers, the firm being unable to turn out all the muck iron they can handle.

Experiments are now being made by a Pittsburgh firm to determine the following points regarding aluminium: 1, specific gravity; 2, melting point; 3, temperature at which it becomes pasty; 4, best annealing temperatures and methods; 5, electrical conductivity; 6, the exactness of the theory that aluminium is absolutely fixed and loses no part of its weight when it is violently heated in a forge fire in a carbon crucible; 7, thermal conductivity; 8, specific heat; 9, the action upon it of water and various acids.

Differential Rope-Block.

The differential rope-block here illustrated sustains the load at any point. The raising is accomplished by pulling on one side of the slack-rope and the lowering by pulling on the opposite side, the danger of the load falling at any time being thus overcome. The strength of the operator is devoted entirely to lifting the load, which is supported while he takes a new

Washburn Company were, however, to pay to the Thorn Wire Hedge Company royalties on all wire manufactured by the Washburn Company and any of their licensees. The bill now claims some \$80,000 to be due the complainant for unpaid licenses. The defense set up is that the Thorn Wire Hedge Company are indebted to the Washburn Company for a large amount of money paid back to their licensees under the Haish decision, by which the granting licenses to

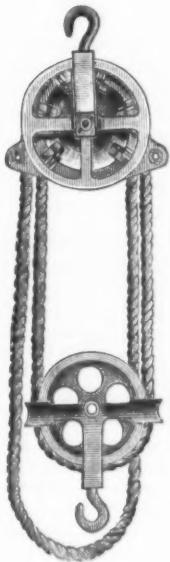


Fig. 1.

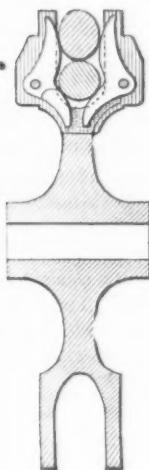


Fig. 2.

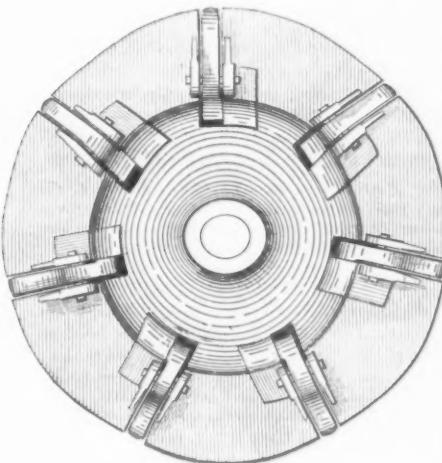


Fig. 3.

DIFFERENTIAL ROPE-BLOCK.

hold. The two turns of the rope are so guided that they lie one on top of the other where they pass over the pulley, as shown in the sectional view (Fig. 2). For the purpose of automatically gripping the rope under the weight of the load, the pulley-wheel is provided with a series of gripping levers, shaped as shown in Fig. 2 and pivoted to the wheel as shown in the side view (Fig. 3). As will be understood from the drawings, these levers are of such form and are so arranged that the strain upon the rope of the weight being hoisted will so act upon them as to cause them to grip the outer turn of the rope and prevent the wheel from turning except when the hoisting power is applied. By this means the pulley is self-locking with the load at any height and the holding power of the levers is in exact proportion to the load. As the increase of power is gained on a single sheave the block is made light, small and compact. The block is adapted for long lifts and the stretching of the rope in no way affects its operation. These blocks are made by the New York Block Company, No. 41 Centre street, New York.

Barb-Wire Litigation.

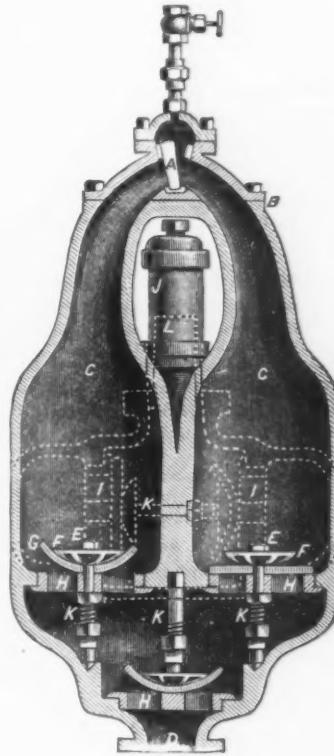
An important barb-wire suit, involving a large sum of money, has occupied the attention of Judge Gresham, in the United States Circuit Court at Chicago, during the past week. The Thorn Wire Hedge Company sue the Washburn & Moen Manufacturing Company for royalty. It appears that the complainant, being the owner of the well-known Kelly barb-wire reissued patents, made a contract in 1876 with the Washburn Company, by which the former sold the Kelly patents to the latter. As a consideration the Thorn Wire Hedge Company were to receive a license from the Washburn Company to manufacture wire under the Kelly patents without paying any royalties. The

Haish to manufacture wire at a less royalty than other licensees invalidated the omnibus agreement with them. Judge Gresham has decided in favor of the defendant. He also dismissed a cross bill by the latter, in which an accounting was sought for moneys claimed to have been overpaid.

Pulsator Pump.

The pump illustrated in the accompanying sectional view consists principally of two cast-iron cylinders C C, joined at their upper extremities by tapering necks, to which is attached, by means of a flanged joint, B, a neck-piece, which forms a continuous passage from each cylinder to one common upright passage into which a small valve, A, is fitted, so as to move alternately between seats formed in the junction. These chambers are also connected at their lower ends by means of openings with a foot-valve chamber and vertical induction passage, D. These openings are so formed that the valve-seats HH and the valves GG, consisting of pure vulcanized rubber provided with suitable guards and bolts to sustain them, may be easily inserted. The delivery passage L, which is common to both cylinders, is also constructed so that in the openings that communicate with each cylinder are placed valve-seats II, indicated by the dotted lines, fitted for the same style of valves as those in the induction passage. The valve-guards FF prevent the valves from opening too far. The bolts EE fasten the valves and their guards to the seats. The vacuum-chamber J is placed between the necks of the cylinders and connects only with the foot-valve chamber. The bolts KK are provided with double square-headed brass nuts and are used to fasten the seats, with the valves and guards attached, in position. The openings to the induction and discharge chamber are provided with hand-hole plates to facilitate the removal and

insertion of the valves, guards, &c. A small brass air-check valve is screwed into the neck of each chamber and one into the vacuum-chamber, so that their stems hang downward. The check-valve in the neck of each cylinder allows a small quantity of air to enter above the water to prevent the steam from agitating it on its first entrance, and thus forms an air-piston for preventing condensation. The check-valve in the vacuum-chamber serves to cushion the ramming action of the water consequent upon the filling of each chamber alternately. The small brass plugs inserted in the hand-hole plates are for draining the pumps of cold water to prevent freezing. When the pump is in action steam and liquid occupy the same cylinder alternately, but do not come in contact with each other, since the arrangement of the air-valves is such that air is admitted into the cylinders at the top ahead of the steam while the liquid is rushing up the suction-pipe at the bottom, the air thus forming a cushion for the steam to strike upon at its entrance. When the water has been displaced by the steam which follows it through the opening to the discharge-chamber it will suddenly condense by passing under the water, and the vacuum thereby formed will cause the steam-valve to change, shutting off the steam from that cylinder and transferring the pressure to the opposite cylinder and at the same time inducing the water to fill the chamber in place of the condensed steam. The alternating action thus set up keeps a nearly continuous stream of water flowing from the pump as long as the supply of both steam and water is maintained. It is evident that the pump is automatic in operation and contains no mechanical element to absorb power. It is claimed that the

*The Pulsator Steam-Pump.*

pump will handle liquid containing mud, sand and other foreign matters without material wear or derangement. This pump is manufactured by John Maslin & Son, of Jersey City, N. J.

The new railroad shops of the Long Island Railroad, at Morris Park, have been completed.

THE WEEK.

The Union City Knife Company's dam at Union City, on the Naugatuck River, was washed away.

The obelisk in Central Park is crumbling from the effects of atmospheric changes, and a committee consisting of Profs. R. Ogden Doremus, Henry Morton, John S. Newburg and A. H. Gallatin have been appointed by the Park Commissioners to devise the best possible remedy for the preservation of the stone.

The Light House Board asks for an appropriation of \$830,000 for the construction of works authorized by Congress but not provided for in the Appropriation bill. Of this, \$500,000 is wanted for the Diamond Shoal Light-House off Cape Hatteras.

A Russian engineer who is now examining the Canadian Pacific Railway says his Government has decided to build a railway across Siberia from the Ural Mountains to the Sea of Japan, at a point 6000 miles from St. Petersburg. The country to be traversed is as far as Lake Baikal is not unlike the Canadian northwest.

India affords a fine field for the introduction of American elevators. The Russians are introducing them in order to compete with India, which must sooner or later resort to them in self-defense.

The trade of India with the United States in 1888-89 was less than during the previous year. Meanwhile India's imports increased equal to \$15,500,000, or 6½ per cent., and among the largest items were cotton piece-goods and yarn. Russian petroleum competed actively with the American product, superseding vegetable oils.

The Austrian Archduke John, imitating Peter the Great, is about to learn practical ship-building in England. The London *News* says: "The emperor was pleased to permit his august relative to take a name better suited to the nature of his employment, and the Archduke John when working in the *incognito* of the ship-yard will henceforth be known as Herr Johannes Orth."

The British Admiralty have authorized a series of exhaustive experiments upon the various patterns of double-distilling apparatus used in the British navy. These contrivances are used to supply water for the crews and the boilers of the war-ships. The experiments will be carried out by the engineers of Devonport Dockyard.

Steam lobster-catches are driving sailing vessels out of the business and are likely to work a revolution.

The co-operation system was on trial in a big clothing house in this city for three years with apparent success, but when a strike was ordered by the trade assembly last week all but three of the 60 cutters employed took away their shears.

About 40 architects in New York and Brooklyn have formed an association to include amateurs as well as professionals.

The Argentine Republic has a "Napoleon of finance" in the person of Minister Pacheco, who recently inaugurated a policy of radical retrenchment. The *Buenos Ayres Standard* says: "The first step of Minister Pacheco was to reduce the issue of paper money. He asked Congress for authority to cut down the issue of paper from \$158,000,000, circulating at present, to \$100,000,000, and to provide a reserve fund of 80,000,000 gold dollars. The impression that this measure, now law of the nation, made in

the market can be imagined. With a few strokes of the pen the minister dispelled all the distrust rampant, and confirmed reviving confidence with a decree fixing the dates for the withdrawal and burning of the paper issue of the National Bank to the amount of \$41,333,333 per annum. In the discussion in Congress special provision was made that all paper withdrawn should be burnt. On November 1 \$5,000,000 greenbacks will be consigned to the ministerial furnace, and the process will be continued in amounts of \$2,000,000 at a time at the end of every month up to the middle of 1892. The gold premium, which had been soaring at a 120 to 125 per cent., at once fell headlong to 100 per cent. and less, and will no doubt fall more every month as the burning of paper money continues."

At Pittsburgh, on Friday, United States District Attorney Lyon entered suits against the Chambers & McKee Glass Company and the presidents of the American Window Glass Workers' Association and the Universal Federation of Window Glass Workers for importing 46 men for employment at the Jeannette Glass Works.

The fact is apparently well established that the failure of the Canadian Pacific Railway Company to obtain steam-ships for their Transatlantic line was due solely to the position of Sir John A. Macdonald, the Prime Minister, with reference to the Halifax terminus. The company determined that they must obtain control of the Government railway between St. John and Halifax, known as the International, in order to prevent possible competition. This being refused, the contract with steam-ship builders in England was repudiated.

Wholly apart from the question of the permanence of the natural gas supply in Pittsburgh, which is far from settled adversely, people have had full opportunity, the *Gazette* says, to learn that even if they have to burn coal or other fuel, the cheapest, cleanest and best way is to convert it into gas and distribute it through the pipes which are already laid.

Mexico is prospering. Banks at the capital are busy and making good dividends. Foreign commerce is increasing and Treasury receipts in like proportion. The currency circulation is reported to be on a sound metallic basis. Crops are good.

Berlin advices speak of Germany's foreign trade as having an unfavorable tendency, exports declining heavily, and threatening a turn in the balance of trade. Manufacturers especially complain of the high prices paid for raw material, coke, coal ore and pig-iron.

Supervising Special Agent Tingle, in his annual report, shows that the aggregate customs collections during the year were \$225,041,419 and the expenses \$6,553,209. The percentage of cost of collection was 2.91, as against 2.94 for the last fiscal year, when the collections were \$220,428,930 and the expenses \$6,481,599. It is advised that the title of the office of Naval Officer at the port of New York be changed to that of Comptroller as a better designation of the functions of the office, and that the office of Naval Officer still existing at five other ports be abolished.

The Florida orange crop this season is estimated by leading New York dealers at 1,600,000 boxes, against 2,000,000 boxes for the season of 1888. The prices paid are \$1.50 and \$2 per box, and adding 50 cents freightage to New York it makes the cost in this market \$2 and \$2.50.

Cleveland, Ohio, proposes to have a permanent industrial exposition. The committee having the subject in charge will report that the cost of arranging for

the construction of the site over the lake, covering ten acres, will be \$100,000, and that the exposition can be made ready at a cost of from \$300,000 to \$400,000. The exposition will not include a race-track, but will be purely an industrial and mercantile exhibition.

The Baltimore and Ohio Railroad contemplate building a dry-dock at Clifton, S. I.

A cold storage warehouse, to cost \$400,000 including the site, will be erected on the water-front in Philadelphia. The first story will have a platform with branch tracks alongside from the trunk line railroads.

The Philadelphia Coal Dealers' Exchange, recently organized, are pulling together to sell honest coal \$5.50 per long ton of 2240 pounds. Violations of the rules are attended with severe penalties.

Of \$2,105,000 which Congress will be asked to appropriate for the improvement of New York harbor, \$400,000 is wanted for the blasting of rocks in Hell Gate and about \$150,000 will be expended on the Hudson River. The work of deepening the channels toward the Narrows will be continued. About \$1,000,000 of the appropriation will be applied to removing the rocks in Harlem River, especially to that part of the work at Suytenduyvil, where it is necessary that the tide should enter with less obstruction.

Vault construction is enjoying a boom throughout the United States. The increasing number of trust companies and banks makes a loud call for chrome steel and other materials that resist the burglar's art.

The Hudson River Tunnel Company have contracted for an enormous cast-iron pipe to hold up the mud under the river while the workmen are digging the tunnel. The pipe is known as a shield by tunnel-builders. It will be forced into the mud by hydraulic pressure. Workmen will then dig out the mud inside of it until they reach the end, when it will be driven ahead again.

A coal operator in Pittsburgh says the amount of coal displaced by natural gas in that city equals 30,000 tons a day, and this rate of consumption has been maintained for two years.

A Paris syndicate headed by the Banque de Paris contracted to provide the late Brazilian Government with \$30,000,000 in gold to create a national bank having the right to replace \$90,000,000 in Government paper with new notes, the bank also receiving 4 per cent. of the stock at par. The syndicate sent to Rio Janeiro on October 26 the sum of \$2,500,000 in gold, receiving in return 4s to that sum. The syndicate now want to retire from the contract.

A coal mine in Assina, beyond Winnipeg, has been burning five years and is supposed to be 200 feet below the surface. Last summer the fire burst through a pit and destroyed 50,000 tons already mined.

The Canadian bank statement for October is not so favorable, the balances retained in New York having been drawn upon to the extent of about \$4,500,000. A year ago the net balances due the banks by agents in Great Britain and the United States amounted to \$24,750,000, while at the present time they are only \$14,320,000, a decrease of more than \$10,000,000 in about as many months.

A singular phenomenon is observed at Indianapolis in the decreasing pressure of natural gas since the announcement of cold weather. *Per contra*, in the Murraysville region, Pennsylvania, the pressure in the gas wells is greater than the pipes can carry. At Homestead it is equal to 500

pounds to the inch. The Philadelphia Company derives satisfaction from the fact that its great pipe of earth-tank steel, the largest in the country, has a superior resisting strength. It is, however, more liable to leakage than wrought or cast iron.

Official statistics of the population of Japan for 1888 show that the total was 39,607,224, of whom 20,000,000 were males.

It is reported from Philadelphia that the Standard Oil Company have purchased more than one-half of the tank-oil steamships afloat for the Transatlantic trade. The object is said to be to head off tramp steamers built in English yards.

The Pacific Short Line have closed a contract with J. M. Moon for a bridge at Sioux City, to be 2280 feet long and of the combination type, carrying steam and cable car tracks.

The Hawaiian Commercial Company, as shown by the report of President Spreckels, has had a very prosperous year. The sugar receipts aggregate 13,340 tons, as contrasted with 10,694 tons the previous year. The net money receipts for sugar gave a total of \$1,427,182.49, or \$107 per ton. Dividends were \$345,000—\$200,000 in excess of those for the preceding year. The net profits were \$750,000, an increase of \$508,122 in the same time. Four thousand more acres are being planted this year. The introduction of Japanese and coolie laborers seems to have been attended with good results. Mr. Spreckels' sugar operations in California and Philadelphia are on a corresponding scale.

Large black-walnut logs are being shipped from Pennsylvania to Europe.

A new jute bagging corporation has been formed, comprising eight mills, six of which they own and which have an aggregate annual capacity of 31,300,000 yards. The new organization is known as the American Manufacturing Company, David Nevins, of Boston, president. The dozen independent mills are stated to have a capacity of 30,600,000 yards, and a sharp conflict is said to be in prospect in the manufacture of bagging for cotton now that substitutes for jute are refused by the European exchanges. The annual consumption of jute bagging is about 50,000,000 yards.

The wood-pulp craze is prevalent in Maine, where large mills for the manufacture of a substitute for rags are springing up in all directions. The most numerous class of mills are those which grind the wood into pulp by means of enormously powerful machinery. There are 13 of these mills now running in various parts of Maine, turning out over 150 tons of pulp daily and requiring 15,000 horse-power for the operation of their machinery. An immense amount of wood is consumed by these pulp-mills. A cord of wood will make about 1650 pounds of ground pulp, 1000 pounds of sulphite fiber, or 800 pounds of soda pulp, so that the present daily consumption of wood is about 500 cords. When all the mills now building or soon to be erected are running the pulp business in Maine will eat up 1000 cords of wood per day. Among the mills now building or proposed are at least half a dozen employing the sulphite process. Ground pulp is worth from \$22 to \$28 per ton, domestic sulphite fiber sells at \$67.50 to \$70 per ton, and the best imported at \$67.50 to \$100. The Germans have a superior sulphite process of their own and produce the best fiber known.

Dominion papers are urging upon the Government the necessity for speedy action, in order that the expectation of the Parliament may be complied with establishing a line of fast steam-ships across the

Atlantic. The original contract having fallen through another must be entered into, backed by a subsidy of \$500,000 a year. Whatever the pretext given for abandoning the contract, suspicions will arise that the rapid advance in the cost of iron and labor were the true reasons. The distance between Canada and Great Britain could be covered in six days by a 17-knot steamer. By January of 1891 the Pacific steamship service contracted for by the Canadian Pacific Railway Company will be established, leaving only the Atlantic end of the route unprovided for. These Pacific steamers are to have a trial speed of 17½ knots and a working speed of 16 knots. In equipment and accommodation they are expected to be the equal of the finest vessels of the Inman, North German Lloyds and Cunard lines.

Canadian authorities are closely examining the coast defenses of British Columbia and are desirous that an adequate naval force shall be maintained at Esquimalt.

Germans propose to cultivate tobacco extensively in South Borneo.

The United States Government expedition for the survey of Alaska at last accounts had been steaming up the river Yukon 11 days and had reached a point 200 miles above St. Michael's. Near its mouth the river is almost 25 miles wide, taking in the various channels through which it reaches the sea. It much resembles the Mississippi. The expedition expected to go 200 miles further.

Steam-heated piers for the preservation of fruit and other perishable commodities landed upon them in cold weather is the latest novelty in shipping circles. One is already in use in Boston. When inclosed and heated the piers are likely to be in demand for special purposes.

The Knights of Labor will send a delegation to the national organization of the Farmers' Alliance, which meets in St. Louis December 30, and the leaders on both sides are said to be confident of effecting an amalgamation.

The oil-well tool manufacturers have organized at Pittsburgh to regulate prices.

In Chicago horses are curried by steam. The brush being attached to a movable shaft evolves rapidly, requiring only a guide. A pair of brushes puts 150 horses through their toilet in two hours.

Nearly \$4,000,000 has been expended in building a canal to overcome obstructions in the Tennessee River, and the first steamer passing through from the Mississippi River has arrived at Chattanooga. The occasion was one of great rejoicing.

The St. Lawrence River closed at Montreal 23d inst.

An old farmer in the Granite State one Sunday morning started to wind up his great silver watch, and found that the key was filled with dirt. Being unable to dig the matter out with a pin the farmer drilled a hole in the key and with a single breath blew all the dust out. Then he sat down to think, and within a month had patented that hole. To-day in Lebanon, N. H., there is a large factory running by electric power wherein are manufactured daily thousands and thousands of watch-keys of every possible size, shape and design. Each one of these keys contains the hole which has been patented by the farmer. The latter has already made a fortune.

The value of the water route to the East is quickly seen, a Western paper says, when the balance-wheel of lake freights is removed from the railways. As soon as the lake routes were obliged to stop taking stuff the railways met in conference. It was not one of those Kilkenny

conferences such as the Northwestern roads have had since last May, but a peaceful and harmonious meeting, in which the Burlington pared off their claws and laid down with their competitors like lambs in a fold. Rates were fixed at once, to last, as a Chicago paper says, "until the lake routes open again the 1st of next May."

In its foreign arrivals New York is practically a British port. The British arrivals during November numbered 215, against only 108 American, and of steamships alone there were 110 carrying the British flag, as compared with 20 under the Stars and Stripes. The total arrivals for the month of all nationalities were 406.

Metal wheel-ways for heavy traffic are advocated with much plausibility and force of reasoning. It is urged that the best of granite pavement in exposed positions lasts only a few years, while wooden blocks, asphalt, &c., are of shorter duration. An experienced traffic manager of good reputation says: "If steel can be substituted for stone and laid as a permanent way for ordinary vehicles, with rails wide enough for all gauges and roughened by indentations for foot-hold, while smooth for wheels, it would seem to solve the whole problem. On such ways one horse would haul as much as four on a stone pavement, and the annual saving to the municipality in repairs would be immense, while outside the rails, which would be rather below than above the surface of the steel, any sort of pavement would suffice." The suggestion is worthy of consideration. A solid-steel roadway on the water front, for example, would be of incalculable advantage.

The earnings of the Brooklyn elevated railroads during the last quarter increased to \$325,000, or 39 per cent., compared with the same time last year, which indicates a growth of business far surpassing the record of the Manhattan company.

Paris papers speak of a highly lucrative caravan trade springing up between Algeria and some of the oases in the Sahara Desert. Merchandise sent into the interior returned profits as high as 125 per cent. It will be the policy of the French Government to extend railroads to the most important of these oases.

The Government is inquiring into the character of the obstructions in Portage Lake Canal, where navigation is impeded by the *débris* and refuse from the copper stamp mills at Hancock and Houghton.

A fire broke out in the Minneapolis Tribune Building from some unexplained cause on Saturday night, and retreat by the elevator being cut off, many of the inmates of the structure were unable to escape. Eighteen persons lost their lives either by burning or leaping from the windows, among whom was Edward Olson, president of the South Dakota University. The building was eight stories high, of brick and terra-cotta, and cost \$165,000, but had only a single fire-escape. It was plastered on wire lath and was reputed to be fire-proof. The elevator was in the center, encircled by a staircase.

In the dressed-beef investigation before the Senate Committee, at Washington, P. D. Armour, of Chicago, testified that prices are lower now than when he began business ten years ago. His firm had not engaged in any combination whatever to fix the price to be paid for cattle or the price for which the product should be sold. An abstract was given of the dressed-beef business of the firm during 1888, showing that 340,650 head had been dressed, on which the net profit was \$418,105, an average of \$1.22 per head. Mr. Armour said that overproduction and overmarketing were responsible for the decrease in prices.

MANUFACTURING.

Iron and Steel.

M. V. Smith, metallurgical engineer, of Pittsburgh, is engaged in erecting an artificial-gas plant at the steel-plate mill of Chess, Cook & Co., at Rankin Station, Pa. The plant is intended to take the place of natural gas.

The Norton Iron Works, of Ashland, Ky., have relined their blast-furnace and made other improvements. It resumed blast during the present week. The furnace will be run on soft iron, for which the firm have made an excellent reputation in the past. The firm are also operating their forge containing 20 puddling-furnaces and expect to continue them in operation, but on Southern pig-iron. Their nail factory of 126 nail-machines is also being operated full time.

Jennings Bros. & Co., Limited, proprietors of the West Penn Steel Works, at Leechburg, Pa., have decided to remove the portion of their plant which is used in making steel to Allegheny City, Pa. A site will be selected during the present week. The firm expect to be making steel by the first of the year. They will erect a 12-ton Siemens-Martin open-hearth furnace. The rolling-mill of the firm will not be removed from its present location.

The Wellston Furnace Company, of Wellston, Ohio, will blow in their No. 2 stack on or about the 1st of January. The entire product of both stacks, however, has been sold so far ahead that the iron is practically withdrawn from the market.

Carnegie, Phipps & Co., Limited, of Pittsburgh, recently placed a trial order for 2000 tons of Bessemer pig-iron with the Talladega Iron Company, of Birmingham, Ala., to be used in their Homestead Steel Works, at Homestead, Pa.

The Illinois Steel Company's additions to their South Chicago plant will comprise, as already noted, four blast-furnaces and open-hearth steel-works and a plate-mill. The construction of the blast-furnaces has begun, and two stacks are so well under way that the company hope to have them completed by the 1st of next July. The other two will probably be finished by the 1st of the following November. Each of these furnaces will have a 21-foot bosh, while the height of each stack will be 85 feet. They will be equipped with the most improved hot-blast furnaces and ten blowing-engines. The contract for the engines has been awarded to the Southwark Foundry and Machine Company, of Philadelphia. Each engine will be of the vertical type, with an 84-inch blowing-cylinder, 42-inch steam-cylinder and 5-foot stroke. There will be 40 steam-boilers in all, but contracts have thus far been made for only half of them, which are to be built by John Mohr & Son, of Chicago. They will be steel tubular boilers, each 20 feet long and 5 feet in diameter. The ground will not be broken for the open-hearth steel-works and plate-mill until next spring. The plans which have been made contemplate the erection of four 15-ton open-hearth furnaces and a plate-mill adapted to the production of all kinds of steel-plates, embracing very wide and heavy sizes.

The North Works of the Illinois Steel Company have shut down for the winter. This is the plant making a specialty of structural shapes, although it was run on rails for a portion of the past summer to relieve the pressure on the other mills of the company. A sufficient stock of shapes has been accumulated to meet the requirements of the trade at this season of the year. The rail-mill at the South Works

of the company will continue in operation until the close of December, when it will be laid off for reconstruction, which will occupy perhaps three months. The other plants belonging to the company will not be shut down, having plenty of work on hand to turn out during the winter, and besides being in very good shape for a steady run.

In our issue of last week we made mention of the failure of Long & Co., proprietors of the Vulcan Forge and Iron Works, at Pittsburgh. A meeting of the creditors was held at the office of the firm, in the Hamilton Building, Pittsburgh, on Friday, the 29th ult. After an informal talk as to the condition of the affairs of the firm, preliminary steps were taken looking to the resumption of operations at the plant. The meeting then adjourned until Wednesday, the 4th inst.

In one week recently the output of the blast-furnace of the Warwick Iron Company, at Pottstown, Pa., amounted to 814½ tons of iron, the largest product for a single day being 124 tons. This is considered to be an extraordinary output for an anthracite furnace measuring only 16 x 70 feet.

The blast-furnace of the Macungie Iron Company, Limited, at Macungie, Pa., recently leased by the Crane Iron Company, of Catasauqua, Pa., was put in blast last week. It is running on Bessemer iron.

The plant of the Johnson Company, at Johnstown, Pa., which has heretofore been operated exclusively with natural gas, is now operated in part with petroleum.

It is rumored that the rolling-mill and blast-furnace operators in the Shenango Valley, Pa., are talking of combining and erecting a large steel plant to cost \$500,000. It is likely that some definite action will be taken in the matter in a short time.

One of the boilers in the rail-mill of the Allegheny Bessemer Steel Company, at Duquesne, Pa., exploded on Tuesday, the 26th ult. It was caused by the failure of the fireman to turn off the natural gas when the pump refused to work. The plant of the firm was damaged to a slight extent, but there was no interruption of operations.

The wire and wire-nail departments of the Beaver Falls Mills of Carnegie, Phipps & Co., Limited, at Beaver Falls, Pa., were put in operation last week after an idleness of some months.

The Spiral Weld Tube Company, of East Orange, N. J., are now considerably more than doubling their mill capacity. They have under contract for delivery before February 1 machines which will turn out 7150 feet per day.

The Iron Gate Iron and Steel Company is the name of a company engaged in the erection of an iron and steel plant at Iron Gate, Va. Some months ago this company bought the old plant of the Moundsville Rolling Mill, at Moundsville, W. Va., and a part of their machinery has been removed to Iron Gate. When completed the rolling-mill department will contain 11 puddling-furnaces, 1 scrap-furnace, 2 heating-furnaces, a 19-inch muck train, a 17-inch bar-train and 8-inch guide and hoop mill. The plant is being built to permit of the erection of 14 additional puddling-furnaces, which will probably be built at some future time. The steel plant will contain a basic open-hearth furnace, a 30-pot crucible-furnace, a cogging train for rolling 8-inch ingots, and a 23-inch plate-mill and a 12-inch and 9-inch mill, steam-hammers and all necessary heating-furnaces. The entire plant will be contained in a building 400 feet long and 25 feet wide, with the exception of the boilers and basic furnace, which

will be in a separate building. The company expect to be in the market with muck iron by the first of the year. The concern is a chartered one, with a capital stock of \$250,000. Jos. D. Weeks and C. V. Young, both of Pittsburgh, are respectively president and secretary of the company.

The Garrett rod-mill of the Iowa Barb Wire Company, at Allentown, Pa., is just being started.

The Etna Furnace Company, Etna, Ga., report the successful blowing-in of their furnace, the product being car-wheel charcoal iron. This furnace has been idle two months, during which time extensive repairs were made.

Hecla Furnace (charcoal), operated by McCoy & Linn, Milesburg, Pa., which was blown in November 22 after a long period of idleness, is reported to be doing well.

The repairs to the Victoria Furnace of the Virginia Iron Company, Goshen, Va., have been completed, and the furnace was blown in on the 24th ult.

The new open-hearth plant of the Passaic Rolling Mill Company, at Paterson, N. J., has been started.

The charcoal stack of the Chatham Furnace Company, Chatham, N. Y., is again in operation.

Pine Grove Furnace (charcoal), S. R. Still, superintendent, Pine Grove Furnace, Pa., has eclipsed its former record, the daily average product for the week ending November 29 being 21½ tons of car-wheel iron, without the use of scrap. The oven and boilers are heated by gases from the furnace, no coal being employed for raising steam.

The renewing of the furnace plant of the Mont Alto Furnace Company, Mont Alto, Pa., has been severely handicapped by continuous heavy rains, but the furnace is now nearing completion, and the company hope to resume at an early date.

Irondale Furnace, Independence, W. Va., idle since April, has resumed, and is making about 350 tons per week.

Catoctin Furnace, Catoctin Furnace P. O., Md., blew in November 28.

Machinery.

William Tod & Co., engineers and machinists, of Youngstown, Ohio, advise us that they are in receipt of large orders for heavy machinery recently. At present they are constructing five blowing-engines and have lately received an order from Carnegie, Phipps & Co., Limited, of Pittsburgh, for a heavy hydraulic machine to make basic brick for lining their new open-hearth steel furnace. They are also making a large hydraulic cylinder to work under 1500 pounds per square inch for a boiler firm at East Saginaw, Mich. In addition to the above they have an order for a 36 x 48 Porter-Hamilton engine for the Beaver Falls (Pa.) mills of Carnegie, Phipps & Co., Limited, and one from Shoenberger & Co., of Pittsburgh, for an 18 x 24 to run their 9-inch train.

The Sharon Boiler Works Company, of Sharon, Pa., have enough work in hand to keep them busy until the new year. They are also figuring on some large contracts which they expect to secure.

The Union Foundry and Machine Company, of Catasauqua, Pa., recently shipped to the Bridgeport Rolling Mill Company, at Bridgeport, Conn., an improved power shear weighing 65,000 pounds, with engine attached.

The Leechburg Foundry and Machine Company, of Pittsburgh, whose plant is at Leechburg, Pa., have been very success-

ful in making ingot-molds and are now receiving orders for them from all parts of the country. As a consequence they have been compelled to increase their cupola capacity in their mold foundry. They have added and have now working successfully another 84-inch cupola and No. 10 Sturtevant blower, and are now able to meet all demands for molds promptly. They recently shipped rolls to the following parties: Three to the Pullman Iron Company, six to the Blandon Rolling Mill Company and three to the Cohoes Rolling Mill Company. They have orders booked from Lindsay & McCutcheon, Coatesville Iron Company, Keystone Rolling Mill Company, Blandon Rolling Mill Company, Schuylkill Haven Iron Company and Crown and Cumberland Steel Company. They have also added a roll-turning department to their machine-shop, and are now finishing many of the rolls they cast.

The Capitol Mfg. Company, of Chicago, have just issued a handsomely-printed catalogue, comprising 32 pages, illustrating and describing the Adams automatic bolt-threading and nut-tapping machine, of which they are the sole manufacturers. It contains separate illustrations of the Adams threading head and automatic device for opening and closing head, a sectional view of the different parts of the head, a cut showing the full size of the die for the No. 3 machine, plan view of the nut-tapping attachment, the automatic pump to throw a stream of lubricant into the head, the No. 2 single machine, the No. 2 double machine, the No. 3 double machine, the No. 4 single machine, the No. 4 double machine, the No. 5 single machine and the No. 7 single machine. Full price-lists are printed, as well as a number of testimonials from prominent firms who have used the machines.

A. B. Bowman, St. Louis, has just received and filled an order from the St. Louis, Alton and Terre Haute Railway Company for a large complement of tools and machinery for their shops at East St. Louis, consisting of railway tools, engine lathes, bolt-cutting machinery, steam-hammer, radial drill, slotter, car-wheel-boring machine, screw machines, &c.

The Bridesburg, Pa., Mfg. Company ceased work last week, and it is said the works are to be sold at public auction. Some of the men thrown out of employment have never worked in any other shops.

The Genesee Foundry Company's buildings in Rochester were burned the 25th ult. The loss is about \$50,000, principally on patterns.

The Colts Fire Arms Company, of Hartford, Conn., have closed a contract with the Driggs Ordnance Company, of Washington, by which the Driggs-Schroeder rapid-firing guns will be manufactured at the Colt factory, in Hartford. Work has already begun upon a large order.

The King Locomotive Company, of New York, have leased the old shops formerly used by the Camden and Amboy Railroad Company, at Bordentown, for a term of years for locomotive repair shops.

Hardware.

H. W. Hill & Co., Decatur, Ill., report that business is extra good with them, better than since 1878, and they have sold more hog-rings this year than ever before, the number reaching close to 16,000,000.

St. Louis Dripping-Pan Company, St. Louis, Mo., although scarcely a year in existence, have made a really creditable showing. Their trade has increased rapidly and they are at present behind their orders. Recent additions to their plant, however, will enable them to handle with promptness all orders intrusted to them,

and they request us to say that those whose orders were received and not filled immediately will have no further cause for complaint.

Jos. Lay & Co., Ridgeville, Ind., report the demand for iron railroad, mill and shop brooms generally excellent, they being in receipt of numerous inquiries from all sources and are compelled to operate their factory to the full extent of its capacity to meet the demand.

The Ludlow-Saylor Wire Company, St. Louis, Mo., are kept busily engaged in their art-metal department. Among the recent contracts received by them, and which they have just finished, is the elevator inclosure in the large wholesale and retail establishment occupied by J. L. Hudson, St. Louis, Mo. The work on this inclosure is of a high quality, the first two floors being built of flat quarter-twist copper-plated-wire; the third and fourth floors are finished in handsome wire-work of the latest design. It is here opportune to say that this house, in addition to carrying a line of designs more or less familiar to the trade, also make special designs for any class of work.

The St. Louis Shovel Company, St. Louis, Mo., are enjoying a good trade. We mentioned in these columns some time since the increase in their plant, whereby they were enabled to double their capacity. That the movement was not premature is evidenced by the fact that the entire increase is utilized.

The Hollow Cable Mfg. Company, Hornellsville, N. Y., report that trade is exceptionally good with them and that they are full of orders.

Miscellaneous.

The Pittsburgh Reduction Company, of Pittsburgh, have received a letter from M. E. Beale, Consular Agent for the United States, at San Luis Potosi, Mexico, asking for information concerning the manufacture of aluminium. The letter is one of the results of the recent exhibit of the company at the exposition building in Pittsburgh during the visit of the Pan-American Congress.

The Youngstown Car Mfg. Company, of Youngstown, Ohio, have plenty of work on hand and operating their works full time. They recently booked an order for 30 freight-cars.

The Lebanon Mfg. Company, of Lebanon, Pa., have orders in hand at present for 600 freight-cars, which is sufficient to keep their works fully employed for several months.

The Crane Iron Company, of Catawissa, have leased a tract of land from J. C. Lehman, near the Strickler ore bank, in South Middleton Township, Cumberland County, Pa., and are prospecting for iron ore.

The Consumers' Heating Company, of Pittsburgh, have been chartered. The capital stock is \$50,000, divided into 1000 shares, at \$50 per share. The directors are: Herbert DuPuy, president; David Shaw, A. H. Clarke, Robert J. Anderson and Robert Josephs.

The Chesapeake Dry Dock and Construction Company have decided to build their new shops at Newport News, Va., of iron and have let the contract for four buildings to the Berlin Iron Bridge Company, at East Berlin, Conn. The bending shed will be 60 x 128 feet, the ship-shed 60 x 330 feet, the machine-shop 100 x 300 feet and the boiler-shop 100 x 300 feet. The building will be made entirely of iron except the side walls, which will be made of iron posts with a light brick wall between, but the roof will be of iron trusses covered with corrugated iron. The buildings for the entire plant will cost complete

about \$250,000 and will be the finest of the kind in this country, being provided with all the modern appliances for handling heavy work quickly and economically.

We have received from the Broderick & Bascom Rope Company, of St. Louis, a catalogue which not only shows the wire ropes and necessary attachments made by them, but also gives much valuable information regarding the use of ropes for the transmission of power and the use of ropes for sustaining dead loads. The catalogue, or rather book, will prove to be of advantage to all those who employ rope for any purpose, since the information, being the result of extended practice and experience, may be regarded as fully trustworthy.

The following new corporations in Illinois were announced during the past week: Norton Can Company, at Chicago; to manufacture sheet-metal goods; capital stock, \$150,000; incorporators, A. D. Norton, E. S. Evarts and W. L. Gifford. Union Barb Wire Company, at Joliet; to manufacture barb-wire fence; capital stock, \$50,000; incorporators, John W. Nadethoffer, Newton Richards and P. C. Hollins. Irvan Brothers Mfg. Company, at Streator; for a general machine business; capital stock, \$30,000; incorporators, L. W. Irvan, H. Irvan and Theo. Rockenfeller. The Chicago Ship-Building Company, at Chicago; for building and repairing vessels of various construction; capital stock, \$350,000; incorporators, W. I. Babcock, C. P. Coffin and J. H. Chandler. Hydrogen Fuel Gas Company, at Chicago; to manufacture devices for making hydrogen gas for fuel; capital stock, \$100,000; incorporators, J. Hoyt, Milton Weston and Mass Alley.

We have received from the Philadelphia office of Merchant & Co. a very handsome set of prototypes of the great Forth Bridge, which is rapidly nearing completion. One view shows the bridge in perspective, the photograph having been taken before the spans were united. The second view is a perspective of the north tower. The massiveness of the structure, as far as its height is concerned, is shown in a side view of one of the towers and its foundation, with some of the highest structures in the world in the background. Only three structures overtop the bridge—the Great Pyramid, Cologne Cathedral and Old St. Paul's, of London. In a side elevation of the whole bridge the principal dimensions are given. A view is also given of the well-known illustration—having a "Jap" sitting on the connecting span—showing the principle of the cantilever. Merchant & Co. were led to prepare these pictures by the great interest manifested in the prototypes of the Eiffel Tower presented by them.

The following among other awards of contracts for furnishing material to be used in the construction of the machinery of the cruisers Nos. 7 and 8, at New York, have been made by the Navy Department: Bethlehem Iron Company, South Bethlehem, Pa., finished-steel shafts, 31 cents a pound (about \$70,000); Midvale Steel Company, Philadelphia, piston-rods, connecting-rods, &c., \$965,577; Oliver Iron and Steel Company, Pittsburgh, rivets, \$5040.

Another tunnel will be built under the lake at Cleveland, 400 feet long and 7½ feet in diameter, to contain pipes connecting with the pumping station. It will be 70 feet below the surface and be auxiliary to pipes already laid.

The Isle Royal Land Company, an English syndicate formed to mine copper in Michigan, have completed their explorations, and next year will commence active operations.

The Iron Age

New York, Thursday, December 5, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

The Western War on Combinations.

Recent occurrences in Missouri and Illinois are of a disquieting nature to corporations interested in maintaining combinations. Included among the names of corporations whose charters are announced to have been revoked by the Missouri Secretary of State are a number of companies of high standing in the iron and hardware trades. The enforcement of the laws of that State against trusts has therefore an immediate interest for our readers, many of whom have business relations with the companies referred to. On the other hand, the decision of the Illinois Supreme Court with reference to the Chicago Gas Trust bodes ill for similarly constituted organizations if the question of their legality should come before it for adjudication. While the laws of Illinois are notably favorable for the formation of corporations, this decision shows that their control within certain limits has at the same time been provided for. The current of popular sentiment is shown by these proceedings in two important States to be running against trade combinations or the formation of monopolies in any line of business, and just as distinctly so as was perceptible several years since when the railroads were the subjects of popular attack. In the State of Missouri the executive officers are showing by their actions that they feel certain that the most vigorous enforcement of the law against trusts and combinations is demanded by the people. An official uncertain of popular approval would have proceeded in but a half-hearted way. In the State of Illinois the supreme judicial authority, in the same spirit, formulates an unmistakable decision which is vigorous in its terms, evidently to comport with the frame of the public mind. Within the somewhat restricted limits of law and precedents there is still a latitude of expression which may be weak or forcible, according to the measure of strength of support coming from the people.

Of course the corporations affected in both States will not quietly bow their heads to the storm and tamely accept the situation. A change of front may be made, but every expedient known to legal ingenuity will be invoked before the question is considered finally and irrevocably settled. It is absurd to class all trade combinations and agreements on a level with trusts, and to indiscriminately condemn them as opposed to public policy. The line will have to be drawn some time, and the opportunity now seems to be at hand. The legal fight to be made in Missouri must go far toward testing the right of any two or three manufacturers or tradesmen to make an agreement as to what prices they shall ask for certain articles. The tendency of all kinds of business

seems to be inevitably toward the formation of larger and larger undertakings, against which smaller enterprises must combine or be driven out of existence. Indiscriminate legislation against combinations would then assist the strong corporations to accomplish their purpose. Changes in modes of manufacture are perpetually effecting revolutions in trade on one hand or the other, which make it desirable for vigorous concerns to get together and reduce expenses in some way so as to be able to continue in the field. The idea of a trust would be wholly foreign to them, yet this newly-awakened public sentiment would embrace them among the enemies of the people.

It will be most unfortunate if through the enforcement of the laws of Missouri a number of manufacturing and mercantile enterprises whose successful growth has been a matter of pride to all enterprising and progressive Missourians should be driven out of their State. The maintenance of a trade agreement may be a matter of such vital importance to an establishment employing hundreds of men and handling large quantities of materials that the cost of removal to another State would be a comparatively small matter. Every commonwealth in the Union does not take the same view of this question as Missouri, and in the absence of national legislation the mere crossing of State boundaries will mean a very great deal to those interested. In Illinois the trust agitation has not assumed a form so radical and the chances are strongly against it. In the late decision the character of a trust is so well defined that it is impossible to class with it the customary trade agreements and regulations.

Thorough Fire-Proof Construction.

Boston has learned through direful experience the necessity of adopting a higher standard of fire-proof construction than any heretofore recognized. Other large towns, too, should diligently heed the stern and indisputable facts now demonstrated beyond a question. Somewhat vauntingly a Boston editor on Thanksgiving morning—on the morning that preceded the disastrous day when a part of the business section of the city was laid in ashes—referred to the destruction in Lynn, remarking as follows: “While it will not do to speak too confidently concerning the future, one is none the less justified in believing that a great, sweeping conflagration is altogether impossible in the newly constructed business district of Boston, and this, too, in spite of the fact that the buildings are, as a rule, higher and larger than those which occupied these sites prior to our great fire. There are parts of our city which have not been thus improved, where the buildings are similar in many respects to those which 17 years ago dissolved in a heap of ruins almost as soon as the great mass of flame struck them. But as fast as the requirements of trade or the results of age cause these old structures to be torn down and replaced by new ones the effect of our building laws comes into play, and the new edifices, if not fire-proof, are at least so far fire-resisting as to make their speedy destruction by an interior fire improbable and their quick consumption by a sweeping conflagration impossible.”

Our large cities have made rapid progress in fire-proof construction since the great fire in Boston in 1872, when nearly eighty millions of property went up in flames. In several respects methods have radically changed for the better, until large areas in New York are covered with structures that cannot burn, presenting an impassable barrier to a sweeping conflagration. Nearly all of the modern office buildings in New York are actually fire-proof. They are to be found in groups in lower Broadway and Wall street, and the district east of the City Hall Park presents many superb specimens. In structures of this character the contract for iron beams, iron columns, rafters, &c., involves a larger sum of money than is represented in the aggregate of materials for masonry, iron being the principal factor. This item ranges not infrequently between \$250,000 and \$300,000 or \$400,000, sometimes reaching even \$500,000. Herein we have a glimpse of the New York of the future, and that not very remote in point of time. Otherwise, even with our excellent fire department and promised abundant supplies of water, there could be no well-grounded assurance that the lamentable experience of Boston and Lynn might not be repeated in the Empire City.

A few days ago a fire broke out in the tenth story of the Western Union Telegraph Building, on the corner of Broadway and Dey street. The entire space under the roof was filled with waste paper, comprising large quantities of the oiled and highly-inflammable manifold sheets in use by the Associated Press. The water-supplies afforded by the system within the building failed and all the conditions were favorable for a destructive conflagration. But the flames beat upon the roofing and heated the flooring of iron and cement without effect, until at length water was introduced by means of hose brought up the winding staircase or lifted over the outside balconies and the mischief arrested. When the Equitable Building was being finished a fire broke out in one of the rooms, burning up the workmen’s tools and all the interior wood-work, but with no more serious consequences. The foregoing are among recent notable instances serving to show that the alleged fire-proof construction practiced in modern New York is a reality and not a sham.

One of the most obvious and practical lessons of the Boston fire is the advisability of dividing all the larger buildings, however occupied, with fire-walls, the openings of whatever kind to be closed with fire-proof doors. Iron shutters perform a similar office, by checking the flames at the start, as was signally illustrated at Boston in the Lawrence building, which prevented the spread of the flames. Among the improved methods are important features, for example the manner of fastening the slate roofing, iron purlins being placed 25 inches apart and bolted to the rafters. These are filled in with porous terra-cotta blocks 3 inches thick, to which the slate are attached. Another feature is the very general use of wrought-iron columns in high buildings, these being preferred by several of our leading architects because less liable to defects which may escape inspection. The hammer test might fail in a defective casting, so it is argued, while a wrought-iron column comprising from 8 to 16 sec-

tions can be examined minutely and in detail. Again, in storage warehouses and similar structures where fires are liable to originate internally the lower flanges of the iron floor-beams are protected by terra-cotta coverings to guard against warp or twist. The improvements being introduced into architectural iron-work and all that pertains to fire-proof construction constitute a hopeful sign, and there is reason to believe that ambition will not rest satisfied until in every city where valuable property is found the quality of permanence and durability will be insisted upon as a primal consideration. This is effectually secured only by the selection of materials practically indestructible either by fire or corrosion. With the hazards of fire eliminated, the business man of to-day will build not only for himself but for posterity. There is nothing in the incidents of the Boston fire that militates against this affirmation.

The Copper Situation.

The rapid rise in the price of lake copper during the past few weeks has been a surprise to both producers and consumers. When the bankers made offerings at 11½ cents and sold about 2,000,000 pounds at that rate the lake companies cut under to 11 cents and protected their customers, many of whom bought up to December delivery. As their orders increased they came into the market for additional quantities, rapidly exhausting what stocks were in the hands of producers. The latter entered into engagements for December and January delivery at steadily rising prices, manufacturers taking quite freely up to 13 cents and buying some at even higher figures. Now any considerable quantity of lake copper could not be purchased at 14 cents for early delivery, and the mining companies appear unwilling to name a price beyond February. So far the rise in lake copper has been entirely legitimate. There can be no doubt that current consumption is enormous. That statement does not rest on allegations at second hand, by sellers, but comes directly to us from the most trustworthy sources among manufacturers, whose interest it certainly is not to be bullish on raw material at this juncture. Nor is this consumption confined, as many may be inclined to believe, to copper for electrical purposes. The requirements for copper and brass are very heavy in all the leading lines.

There is only one dark cloud in the sky, and that is the stock of syndicate copper on this side of the Atlantic. It is in the hands of bankers here, who, however, have no direct control over it. They are acting merely under orders from principals on the other side of the Atlantic, who have not as yet shown any disposition to entertain orders. They were offered 13 cents ten days ago for a block of 500,000 pounds, without paying any attention to it. The course of the market in the near future will depend upon the manner in which this stock, estimated at 15,000,000 to 20,000,000 pounds, is marketed, if it is offered for sale at all. The idea has been expressed that there was some understanding between the foreign holders and the American mines—that both were parties to an armistice, as it were—the former engaging not to sell here, providing the latter

do not ship anything abroad during a fixed period. There is no evidence that such a compact exists, and we are inclined to believe that there was no necessity for it so far as the lake mines are concerned.

So far as the casting brands are concerned, their position is less well-defined. It may be of interest in this connection to state, however, that a new company has been formed to establish copper-refining works at Jersey City, to produce about 500,000 pounds of refined copper per month. Considerable progress has already been made with the preliminary work. While not of much immediate significance, this fact is interesting, because it indicates that the tendency is toward keeping our furnace material at home, so that competition in casting brands will be much livelier in 1890 than it has been in 1889.

The English Imperial Institute.

Since our Centennial all commercial nations have made great exertions to extend their business relations beyond the seas, especially in manufactures, because their production had increased so much that a better outlet for the annual surplus had to be found. The efforts made were generally attended with success, because most of them were well directed. Then, too, population in and the means of communication with those remote regions had increased. Even more would have been accomplished during the first ten years had not wool, coffee, sugar, &c., been so low. Since then these staples have appreciated, and the purchasing capabilities of the people producing them have become all that could be wished. But competition is more active than ever; it has become so keen between the English and Germans that it stirred up the former to greater efforts, particularly because India and the British colonies do not discriminate in favor of goods from the mother country. The Indian and Colonial Exhibition in London in the summer of the jubilee year 1887 has in many respects been a revelation, not only by reason of the goods shown, but of the statistics that accompanied them. It has led to the creation of the Imperial Institute of the United Kingdom, the Colonies and India. This institute is to be a museum, to which

will be transferred whatever there was good in the jubilee exhibit, and in addition whatever shall have been gathered by March, 1891, when the institute building, a magnificent structure, having 1100 feet frontage, will be finished. In the meantime the Board of Directors of the institute sent Lord Herschel to India and Sir Somers Vine to the colonies to agitate for it and solicit contributions in money. These have been received to the amount so far of £250,000. The countries visited have promised to gather more samples of manufactures and products, the exhibition of which will be one of the main objects in view. The British Government recommends that an agent be appointed and well paid at each of the commercial centers, both in India and the colonies, to stimulate and supervise the collecting of samples and all useful information. The institute will possess its own organ in London, the *Imperial Institute Journal*, which is to publish commercial and other statistics, schedules of means of communication, laws, legal decisions, items relating to

patent and trade-mark protection, to new products and the sources of supply of old ones and news about emigration and colonization. Besides, each colony is to have in turn an annual exhibition either at home or in England. An arrangement has been made with King's College, London, that young men be taught Oriental languages there under the auspices of the institute.

The president of the institute is to be the Prince of Wales, assisted by a general council of 100 members, of which the Queen will appoint 10, 45 will represent the United Kingdom, 30 the colonies and 15 India. The following high officials are to be honorary members: The Speaker of the House of Commons, the Governor of the Bank of England, the Lord Mayors of London and Dublin and the Lord Provost of Edinburgh. Commerce and industry will be represented from 17 districts, into which Great Britain has been divided for the purpose. The Associated Chambers of Commerce will send three delegates, and there will be one from the London Chamber of Commerce alone, from the Royal Agricultural Society of England, the Highland Society the Royal Dublin Agricultural Society and five scientific societies. A club is to be an adjunct to the institute, which will be most luxuriously furnished throughout.

As there exists a general feeling in the vast empire to draw closer together, its future seems bright. The jubilee statistics show that the British empire covers an area of 9,289,453 square miles; that the population was 328,388,511 in 1887, against 304,632,475 in 1881; the import in 1887, £553,413,679; the export, £470,351,847; vessels entered and cleared, 156,278,059 tons; railways in operation, 58,326 miles; telegraphs, 138,242 miles; and savings-banks deposits, £135,923,278. The probability is that an institute of the kind at New York will be the outcome of our exhibition of 1892. In several respects the Imperial Institute, then fairly under way, may serve as a model to us. From this point of view, therefore, exceptional interest attaches to this purely British creation.

Investments by English Syndicates.

Hardly a day passes without its report that an English syndicate has purchased some industrial property, generally at a very liberal price. This is regarded by many as conclusive proof that another great enterprise has passed into the hands of British capitalists, and causes some alarm in a portion of the community. As a matter of fact very few of these elaborate schemes go through. Nearly every iron-producing concern of any consequence has been approached, but the final purchase has been effected in only one case. The whole movement is one initiated by a few clever promoters. They attempt to secure options for the purchase of prominent plants which can be proved beyond a doubt to have earned over a considerable period of years profits considered exceptionally good even by American manufacturers. English investors are supposed to be content with a much smaller rate of interest on their capital. The undertaking is put on a capital basis commensurate with that rate of profit, the promoters and the banks of issue pocket-

ing the difference between the American valuation and that of the British investor. In other words, an American manufacturer is willing to sell at a lower price than the small English capitalist is anxious to pay for a chance to participate in a business which has a good earning record.

But there are many obstacles to overcome between the act of securing an option and the successful placing of large amounts of common and preferred stock, debentures and bonds with a relatively large number of people in a distant country. This is clearly proved by the fact that relatively few of the many schemes talked of in our newspapers have ever reached the point of coming before English investors. In some instances the promoters have failed to avail themselves of their options at all by not making the first payments. In other cases they have defaulted on the second or subsequent payments. It is stated, too—although we have no direct evidence on this point—that the English public have not taken up the shares and debentures offered, leaving promoters and bankers to shoulder the burden themselves with those outward signs of joy at success which are bred by the anxiety to uphold real or fancied prestige.

On general principles Americans can have little or no objection to the investment of English capital in American enterprises. If our cousins on the other side are willing to pay a satisfactory price to Americans, that is the good fortune of the seller. Nor will other producers in the same line of business be alarmed at the transfer of rival concerns into the hands of foreign capitalists, particularly if they must earn profits on a greater investment. The danger, if there be any serious danger, lies in the use to which the American seller will put the funds thus liberated. Few men who have grown wealthy in a particular line of business, who know it thoroughly, are acquainted with its personnel and are versed in its opportunities for the utilization of skill, will readily enter some other department of industry. In the majority of cases, unless they desire to retire altogether, they will be found irresistibly drawn to their old lines of work. There is an added temptation. A very large number of our plants, responding to increasing demands, have grown from small beginnings through a series of makeshifts. Give a manufacturer who has been keenly conscious of the defects of his plant a chance to develop a new similar enterprise with a clean sheet of paper and abundant funds, and how many could resist such a temptation?

If, therefore, the promoters who have been so industriously scouring the country for gilt-edged enterprises were successful in the future to a larger extent than they have been in the past, the main danger would lie in the diversion, indirectly, into an industry of more capital than it could at times profitably support. The keenest blow would fall on the foreigners, but all would be hurt to some extent.

A syndicate of New York capitalists have purchased the Dismal Swamp Canal, in Virginia and North Carolina, for \$75,000. The new owners intend to rebuild the locks and widen and deepen the canal for vessels of the largest draft, and make this route the connecting link from Chesapeake Bay with the great inland waterway of the Atlantic coast.

CORRESPONDENCE.

The Discussion on Rolling Steel Rails.

To the Editor: In your issue of November 28 you make Mr. Hunt, of Chicago, say some things during the discussion at the meeting of Mechanical Engineers on Mr. Nicholson's paper on rolling steel rails, for which this Mr. Hunt must decline being held responsible. I said during that discussion that the only satisfactory steel rolls on which shapes were produced which I had been able to obtain were made by Isaac G. Johnson & Co., of Spuyten Duyvil, and were used by me at the Troy Works. As they were a set of three finishing rolls for a 21-inch rail train you will appreciate that they were not particularly small. I also said they could be more truthfully called semi-steel, as while harder than cast-iron they did not have the ductility of the metal commercially called steel, and had, I believe, about 2 per cent. carbon. Again, I thought I stated that owing to the production of rails—not rolls—having been so greatly increased in almost all of the American mills the cost of rolls per ton of output had become a comparatively insignificant matter. I certainly did not intend to say the mill with which I was connected turned out in October 28,491 tons of rails from one train of rolls, &c. I am not connected with any rail or other mill excepting so far as my duties as the inspecting representative of many of the leading railroad organizations compel me to watch their product. My pride as a resident of Chicago may have caused me to say that one of our Chicago mills made a record in October far ahead of the whole world. That glory belongs to the organization of the Union Steel Works department of the Illinois Steel Company. While I may feel a trifle sad that such achievements have come since my day of management, I nevertheless most warmly applaud the successful ones. I remain yours truly,

ROBERT W. HUNT.
CHICAGO, ILL., November 30, 1889.

Wm. H. Webb, of this city, the well-known ship-builder, has been examining the models exhibited at the Paris Exposition and reports finding one proposed by the Fairfield Building Company, late John Elder & Co., of Glasgow, Scotland, as an addition to the Guion Line between New York and Liverpool. The dimensions of this vessel are 500 feet in length, 63 feet beam by 32 feet depth. She is planned for twin screws, and would be 11,500 tons, as written, with the model to make the passage in five days. Mr. Webb predicts her failure.

The remarkable achievement of sinking a deep shaft through treacherous grounds by means of first freezing the earth has been accomplished at the Chapin Mine, in the upper Michigan peninsula, by the Poetsch process. The contract was to freeze, excavate and curb up a rectangular shaft 15½ x 18½ feet and 100 feet deep. This was done by first putting down the freezing-pipes 3 feet apart, in a circle 29 feet in diameter, to the depth proposed to be reached by the shaft. The pipes were connected at the top and filled with a solution containing 25 per cent of calcium chloride. The brine was frozen to a point below zero by means of an ice machine, and in 40 days a wall of ice, earth and stone was formed 10 feet thick. The excavation in the meantime had been going on, and 70 days from the commencement it was completed to the ledge 100 feet down, in spite of some difficulty from the percolation of water near the bottom, which was stopped by freezing. Except for this ingenious method the sinking of the shaft

would, it seems, have been practically impossible on account of the great inflow of water.

OBITUARY.

HIRAM H. FISHER.

Col. Hiram H. Fisher, a civil engineer and well-known manufacturer of iron pipe, died at his home in Allentown, Pa., November 23, aged 57 years. Colonel Fisher was born in Hamburg, Berks County, Pa., but early removed with his parents to Harrisburg, where he was educated at the Harrisburg Military Academy, having among his schoolmates Hon. J. Donald Cameron, Gen. Horace Porter and others now well known in public life. He selected, says *Engineering News*, civil engineering as a profession, and about 1850 he was assistant to Mr. Harry Nichols, now chief engineer of the Philadelphia and Reading Railroad Company, and later was with Mr. Geo. B. Roberts, present president of the Pennsylvania Railroad Company. In 1856 he was connected with the Allentown Railroad Company and then for some years after he was a mining-engineer in the coal regions of Pennsylvania, becoming chief engineer and general agent of the Union Coal Company. He was also the engineer of the Howard Coal and Iron Company's Railroad, now a part of the Lehigh and Susquehanna Railroad. In 1866 Colonel Fisher located in Allentown, Pa., and built the Fisher Foundry, where he was first engaged in making car-castings, but in 1873 he commenced the manufacture of iron pipe by a process of his own invention and established the now well-known Fisher Pipe Mfg. Company, of which firm he was president at the time of his death. Colonel Fisher was one of the most courteous, genial and kind-hearted of men, and a host of friends will mourn his loss.

DANIEL HILLMAN.

On the 25th ult. D. Hillman died at Redding, Ala., in his prime, from a cancerous affection of the tongue and throat. Mr. Hillman was the son of Daniel Hillman, who was an early settler at Nashville. He was the pioneer iron-maker on the Cumberland River and was the head of the great iron firm of Hillman, Vanleer & Co. He was the first to discover the great advantage of the Birmingham district, and made large and valuable investments there. Upon his death young Daniel inherited a comfortable fortune, which has been largely increased, and at the time of his death he was the president of the Morris Mining Company and the wealthiest man of his age probably in Alabama. His life was insured for \$75,000, and this, together with his fortune, was willed to his wife. He was married a little over a year ago to Miss Means, of Montgomery, who survives him. He was the half-brother of T. T. Hillman and brother to James and G. Hillman, all of whom are well known.

A new wrinkle in foundry practice has been introduced in the establishment of the Winslow Bros. Company, manufacturers of ornamental iron-work at 376 to 396 Carroll avenue, Chicago. The foundry is two stories high, instead of one, as usual. The heavy work is done on the first floor and light work on the second. The iron is first poured into bull ladles when intended for the up-stairs work, then elevated to the second floor, and is there poured off as in other foundries. It is found that so little time is required to hoist the metal that it has lost none of its heat.

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In this connection it may be asked, Why do not buyers have the requisite quantity of material on hand to provide for the orders they may receive or accept? Two if not more reasons may be given for this, viz.: the lack of room for storage or the financial ability to carry such heavy loads. Referring to this latter, it would be manifestly unwise not to make contracts for future delivery of the raw material required, in view of fluctuations in values, always liable to occur, and over which they have no control.

So much for the manufacturer. Let us look at the producer of pig-iron. In this article it will be taken for granted that he is not engaged in a speculative but in a legitimate business, working for a fair, if not liberal, remuneration for his investment. He also must lay in supplies of ores, fuels, limestones, &c. Now, while it would not be the part of wisdom to sell all of his product for future delivery, in our judgment it would be prudent to dispose of a portion in this way. Several substantial reasons, we think, can be given for the pursuance of this policy. First, in the purchase or mining of his raw material he divides to some extent with the buyer the risk of decline in values. Should these values advance he has the remaining portion of his product to hold for such advance. Again, in selling for delivery of so much per month he reduces materially the hazard of credit. In other words, when selling for cash the purchase of, say, 500 tons per month for six months reduces the risk of payment in the proportion of one to six. This we regard as a very decided advantage to the furnace man and one not to be overlooked.

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Makers of pig-iron will bear in mind that they are the principals, and the commission merchants, their sales agents, are by law required to act strictly in accordance with instructions. If the former will absolutely refuse to approve all transactions which are not equally fair for the sellers as for the buyers, they will find in the large majority of cases that the latter will most cheerfully act upon a just and equitable basis.

Senor Lequir, a merchant of Lima, Peru, lately in this city, says the contract with foreign bond-holders, now approved by Congress, was well received by the press and the people as giving an opportunity to the country to recover itself and to regain its credit.

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(From Our Regular Correspondent.)

WASHINGTON, D. C., December 3, 1889.

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The members of the board express the view that plates subjected to higher treatment by this process can be made to resist anything. They are highly gratified with the results of their experiments, and will make a report which will embody in official form and detail what has already been stated in *The Iron Age*. The ordnance experts do not hesitate to express the opinion that this discovery will entirely revolutionize steel and armored ship-building.

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ing the difference between the American valuation and that of the British investor. In other words, an American manufacturer is willing to sell at a lower price than the small English capitalist is anxious to pay for a chance to participate in a business which has a good earning record.

But there are many obstacles to overcome between the act of securing an option and the successful placing of large amounts of common and preferred stock, debentures and bonds with a relatively large number of people in a distant country. This is clearly proved by the fact that relatively few of the many schemes talked of in our newspapers have ever reached the point of coming before English investors. In some instances the promoters have failed to avail themselves of their options at all by not making the first payments. In other cases they have defaulted on the second or subsequent payments. It is stated, too—although we have no direct evidence on this point—that the English public have not taken up the shares and debentures offered, leaving promoters and bankers to shoulder the burden themselves with those outward signs of joy at success which are bred by the anxiety to uphold real or fancied prestige.

On general principles Americans can have little or no objection to the investment of English capital in American enterprises. If our cousins on the other side are willing to pay a satisfactory price to Americans, that is the good fortune of the seller. Nor will other producers in the same line of business be alarmed at the transfer of rival concerns into the hands of foreign capitalists, particularly if they must earn profits on a greater investment. The danger, if there be any serious danger, lies in the use to which the American seller will put the funds thus liberated. Few men who have grown wealthy in a particular line of business, who know it thoroughly, are acquainted with its *personnel* and are versed in its opportunities for the utilization of skill, will readily enter some other department of industry. In the majority of cases, unless they desire to retire altogether, they will be found irresistibly drawn to their old lines of work. There is an added temptation. A very large number of our plants, responding to increasing demands, have grown from small beginnings through a series of makeshifts. Give a manufacturer who has been keenly conscious of the defects of his plant a chance to develop a new similar enterprise with a clean sheet of paper and abundant funds, and how many could resist such a temptation?

If, therefore, the promoters who have been so industriously scouring the country for gilt-edged enterprises were successful in the future to a larger extent than they have been in the past, the main danger would lie in the diversion, indirectly, into an industry of more capital than it could at times profitably support. The keenest blow would fall on the foreigners, but all would be hurt to some extent.

A syndicate of New York capitalists have purchased the Dismal Swamp Canal, in Virginia and North Carolina, for \$75,000. The new owners intend to rebuild the locks and widen and deepen the canal for vessels of the largest draft, and make this route the connecting link from Chesapeake Bay with the great inland water-way of the Atlantic coast.

CORRESPONDENCE.

The Discussion on Rolling Steel Rails.

To the Editor: In your issue of November 28 you make Mr. Hunt, of Chicago, say some things during the discussion at the meeting of Mechanical Engineers on Mr. Nicholson's paper on rolling steel rails, for which this Mr. Hunt must decline being held responsible. I said during that discussion that the only satisfactory steel rolls on which shapes were produced which I had been able to obtain were made by Isaac G. Johnson & Co., of Spuyten Duyvil, and were used by me at the Troy Works. As they were a set of three finishing rolls for a 21-inch rail train you will appreciate that they were not particularly small. I also said they could be more truthfully called semi-steel, as while harder than cast-iron they did not have the ductility of the metal commercially called steel, and had, I believe, about 2 per cent. carbon. Again, I thought I stated that owing to the production of rails—not rolls—having been so greatly increased in almost all of the American mills the cost of rolls per ton of output had become a comparatively insignificant matter. I certainly did not intend to say the mill with which I was connected turned out in October 28,491 tons of rails from one train of rolls, &c. I am not connected with any rail or other mill excepting so far as my duties as the inspecting representative of many of the leading railroad organizations compel me to watch their product. My pride as a resident of Chicago may have caused me to say that one of our Chicago mills made a record in October far ahead of the whole world. That glory belongs to the organization of the Union Steel Works department of the Illinois Steel Company. While I may feel a trifle sad that such achievements have come since my day of management, I nevertheless most warmly applaud the successful ones. I remain yours truly,

ROBERT W. HUNT.

CHICAGO, ILL., November 30, 1889.

Wm. H. Webb, of this city, the well-known ship-builder, has been examining the models exhibited at the Paris Exposition and reports finding one proposed by the Fairfield Building Company, late John Elder & Co., of Glasgow, Scotland, as an addition to the Guion Line between New York and Liverpool. The dimensions of this vessel are 500 feet in length, 63 feet beam by 52 feet depth. She is planned for twin screws, and would be 11,500 tons, as written, with the model to make the passage in five days. Mr. Webb predicts her failure.

The remarkable achievement of sinking a deep shaft through treacherous grounds by means of first freezing the earth has been accomplished at the Chapin Mine, in the upper Michigan peninsula, by the Poetsch process. The contract was to freeze, excavate and curb up a rectangular shaft 15½ x 16½ feet and 100 feet deep. This was done by first putting down the freezing-pipes 3 feet apart, in a circle 29 feet in diameter, to the depth proposed to be reached by the shaft. The pipes were connected at the top and filled with a solution containing 25 per cent of calcium chloride. The brine was frozen to a point below zero by means of an ice machine, and in 40 days a wall of ice, earth and stone was formed 10 feet thick. The excavation in the meantime had been going on, and 70 days from the commencement it was completed to the ledge 100 feet down, in spite of some difficulty from the percolation of water near the bottom, which was stopped by freezing. Except for this ingenious method the sinking of the shaft

would, it seems, have been practically impossible on account of the great inflow of water.

OBITUARY.

HIRAM H. FISHER.

Col. Hiram H. Fisher, a civil engineer and well-known manufacturer of iron pipe, died at his home in Allentown, Pa., November 23, aged 57 years. Colonel Fisher was born in Hamburg, Berks County, Pa., but early removed with his parents to Harrisburg, where he was educated at the Harrisburg Military Academy, having among his schoolmates Hon. J. Donald Cameron, Gen. Horace Porter and others now well known in public life. He selected, says *Engineering News*, civil engineering as a profession, and about 1850 he was assistant to Mr. Harry Nichols, now chief engineer of the Philadelphia and Reading Railroad Company, and later was with Mr. Geo. B. Roberts, present president of the Pennsylvania Railroad Company. In 1856 he was connected with the Allentown Railroad Company and then for some years after he was a mining-engineer in the coal regions of Pennsylvania, becoming chief engineer and general agent of the Union Coal Company. He was also the engineer of the Howard Coal and Iron Company's Railroad, now a part of the Lehigh and Susquehanna Railroad. In 1866 Colonel Fisher located in Allentown, Pa., and built the Fisher Foundry, where he was first engaged in making car-castings, but in 1873 he commenced the manufacture of iron pipe by a process of his own invention and established the now well-known Fisher Pipe Mfg. Company, of which firm he was president at the time of his death. Colonel Fisher was one of the most courteous, genial and kind-hearted of men, and a host of friends will mourn his loss.

DANIEL HILLMAN.

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TRADE REPORT.

Chicago.

Office of *The Iron Age*, 50 Dearborn street, CHICAGO, December 2, 1889.

Pig-Iron.—The past week has been decidedly eventful. The largest transaction, and one of the most important of the whole year, was a sale of 20,000 tons of Bessemer Pig at \$22, for delivery in 1890. No more is to be had at that price, but at least \$1 advance would be asked. A 500-ton order for Bessemer Pig, to meet very stringent specifications, was placed at \$25. Foundry Iron is in good demand and higher, but there is quite a discrepancy in the prices asked by leading makers. One quotes No. 1 at \$20, cash, No. 2 at \$19 and No. 3 at \$18, and reports sales at those figures. Another quotes No. 1 at \$18.50, No. 2 at \$18 and No. 3 at \$17.50. A third quotes No. 1 at \$19.50, No. 2 at \$18.50 and No. 3 at \$18. Although no very heavy deals in Lake Superior Charcoal have come to light, makers are becoming firmer in their views, and now the minimum quotation is \$20.50, cash, while some ask \$21 and others name \$22 as their bottom rate. American Scotch (Blackband) Irons are quite scarce, all but two or three brands being out of the market, and for these quotations vary from \$20.50, cash, to \$21 @ \$21.50, according to brand and quantity. Southern Coke Iron is practically out of the market and quotations would mean nothing. Ohio Silvery is held at \$19 @ \$19.50, cash, for No. 1; Tennessee Charcoal, No. 1, \$20 @ \$20.50; Southern Standard Car-Wheel, \$25 @ \$26.50.

Bar-Iron.—Some of the mills selling regularly a large part of their product in this market have taken heavy orders elsewhere during the past week and now ask 2¢ flat for Car-Iron delivered in this vicinity. Their competitors will shade this price \$1 per ton or so; but the market seems to be moving upward and it will probably be but a short time until the figure named becomes the regular quotation. For ordinary specifications of Common Iron it is possible that a very few mills may still be willing to name 1.90¢, f.o.b. Chicago, half extras, but 1.95¢ is more frequently quoted. A large buyer succeeded in placing a heavy order at a slightly better price, but he is regarded as exceptionally fortunate in the present condition of the market. Small lots from stock are still sold at 2.1¢ @ 2.2¢, according to quantity and quality.

Structural Iron.—The dull season for architectural foundries is now here and few of them are working. Large contracts are coming up soon, however, and it is asserted that enough business is in sight to keep all the works of the kind in this vicinity actively employed next year. Usually such contracts are placed after the 1st of January, but this season is expected to open earlier. One large building is already in the market which will require 1000 tons of Castings and over 1000 tons of Beams. Mill lots are quoted as follows, f.o.b. Chicago: Angles, 2.45¢; Tees, 2.90¢; Sheared Plates, 2.60¢; Universal Plates, 2.55¢; Beams and Channels, 3.20¢. Small lots from stock are sold at the following rates: Angles, 2.70¢ @ 2.75¢; Tees, 3¢; Beams and Channels, 3.70¢.

Plates, Tubes, &c.—The week witnessed a good demand from stock with some excellent mill orders. Carload lots are quoted as follows, f.o.b. Chicago: Nos. 10 to 14 Iron Sheets, 2.70¢; Steel do., 2.85¢; Tank Iron, 2.60¢; Tank Steel, 2.75¢. From store the following prices are quoted: Iron Sheets, Nos. 10 to 14 2.90¢ @ 3¢; Steel do., 3¢ @ 3.1¢;

Tank Iron, 2.70¢; Tank Steel, 2.85¢ @ 2.95¢; Shell Steel, 3¢ @ 3.1¢; Flange, 3.50¢; Fire-Box, 4.25¢ @ 5.50¢; Ulster Iron, 3.75¢; Boiler-Rivets, 4¢ @ 4.25¢; Boiler-Tubes, 50 % off for 1½-inch and less and 55 % off for 2-inch and upward.

Sheet-Iron.—Quotations on Black Sheets continue on the basis of 3.15¢ @ 3.20¢ at mill for No. 27 and 3.50¢ from store. Galvanized Iron is quoted by jobbers at 50 and 10 % off for Juniata, while heaviest buyers are only able to get 62½ % off from mills. November fell below October in the volume of trade in Galvanized Iron, but was nevertheless a most excellent month for agents and dealers.

Merchant Steel.—While general trade shows a falling off from week to week, the demand from the railroads is improving and the prospects are bright for a heavy business in that direction. Tool Steel is very firm, and although quotations are as yet unchanged, an advance is expected at an early day on account of the much greater cost of Swedish Iron as compared with ruling prices for years past. Carload lots are quoted as follows, f.o.b. Chicago, base prices: Open-Hearth Spring Steel, 2.65¢ @ 2.75¢; Tire, 2.60¢; Toe Calk, 2.60¢ @ 2.75¢; Machinery, 2.60¢ @ 2.75¢. Small lots from store are quoted as follows: Machinery, 2.75¢ @ 3¢, according to finish; Tire, 2.70¢; Tool, 7.50¢ upward; Sheet, 7¢ @ 10¢.

Steel Rails.—Chicago manufacturers are now quoting \$37 @ \$37.50. These prices are mainly based on rates now being named by Eastern mills and not on actual sales, as business at present is very quiet.

Track Supplies.—Large orders continue to come forward, as railroad officials are convinced that it is well to purchase now for next year's requirements. Quotations are as follows: Soft Steel Splice-Bars, 2.25¢; Iron do., 2¢ @ 2.1¢; Spikes, 2.25¢ @ 2.30¢; Square-Nut Bolts, 2.90¢ @ 3¢; Hexagon do., 3.05¢ @ 3.10¢.

Old Rails and Wheels.—In Old Iron Rails considerable business has been done, and the market now ranges from \$26.25 to \$26.50. The railroads are not shipping the Rails which they have sold as promptly as agreed upon, and it is inferred that the supply is short, although it may be due in some cases to a scarcity of cars. Old Steel Rails are selling freely at \$20 @ \$21, according to length. Car-Wheels are again quiet, with holders asking \$20 and consumers out of the market.

Scrap.—Inquiries are being received from Eastern rolling-mills, which may stiffen prices, but stocks have been accumulating so rapidly of late that a weak feeling has developed among some of the dealers. Small quantities could probably be picked up at less than dealers' regular selling prices, which are as follows, per ton of 2000 lb: No. 1 Forge, \$22; No. 1 Mill, \$18; No. 2 Mill, \$12.50; Car-Axes, \$26; Fish-Plates, \$22.75; Horseshoes, \$20.50; Pipes and Flues, \$16; Cast Borings, \$9.50; Wrought Turnings, \$14; Axle Turnings, \$15.50; Machinery Cast, \$14.50; Stove-Plates, \$11; Coil Steel, \$17.50; Leaf Steel, \$18.50; Tires, \$19; Mixed Steel, \$15.50. They are paying \$17.50 for Mixed Country Scrap.

Hardware.—A very good demand is still experienced for both Shelf and Heavy Hardware. Leading jobbers state that they have seldom known such a heavy trade in progress at this season of the year. Instances are cited of stocks in certain lines which have been laid in for the third time to fill supposed requirements to the end of the year, although in each case an unusually large order was placed because of the very low prices then ruling and the belief in a heavy fall trade. As November and December are ordinarily dull months they were looked forward to with some anxiety by those who were

compelled to carry extended lines, as it was feared that prices might sag if the demand should be light. But November has turned out unexpectedly well, and the prospects for December are so bright that now nothing seems to be in the way of a most promising condition of affairs in mercantile circles for the new year.

Nails.—While the nominal price of Cut Steel Nails is still \$2.25, at mill, for specifications averaging 25¢ above base, concessions are being made by one or two mills for deliveries before January 1. It seems that all of them were not equally fortunate in disposing of their output for the remainder of the year. The high price of Bessemer Pig and the resulting advanced cost of Steel will probably prevent the concessions being extended to deliveries for next year, and in fact a further advance in Nails would seem to be necessary to cover cost. Jobbers quote small lots at \$2.50, from stock. Wire Nails are quoted \$3 at factory and \$3.15 for small lots from stock.

Barb-Wire.—The demand has been somewhat light during the week, buyers apparently being disposed to pursue a waiting policy to see what would turn up. It is now known that several large Western manufacturers will under no circumstances coalesce with the Federal Steel Company. Should the projectors of the scheme resolve to go on with it, although controlling but a portion of the trade, these Western concerns will operate independently, consulting their own interests in what they do. Those who have been deferring their purchases of Barb-Wire in anticipation of this result, believing that prices would be demoralized, must bear in mind that other and very potent influences, such as the dearth of Rods, both in this country and abroad, will prevent a decline in the finished product. Small lots of Painted continue to sell at 3.25¢ and carload lots at 3.15¢, with 60¢ per 100 lb more for Galvanized.

Pig-Lead.—A quiet week in this line is reported. A sale was made at 3.65¢ early in the week, but toward the close that price was refused by sellers, who evince a firmer feeling. Leading members of the trade regard present prices as very low and advise buyers to watch closely the course of events.

The Minerva Furnace Company's blast-furnace, at Milwaukee, Wis., is now doing excellent work, turning out about 70 tons of Pig-Iron daily, or very close up to its maximum capacity. The Iron is made largely from Brown Hematite Ore mined at Wildwood, Wis., and resembles in quality and characteristics the Lowmoor Iron of Virginia, being soft yet strong. Forsyth, Hyde & Co., of Chicago, are sales agents.

Cleveland.

CLEVELAND, December 2, 1889.

Iron Ore.—The Ore men generally do not believe that the market for next season will formally open before the last of January or until the companies owning or controlling the mines have held their annual meetings, distributed dividends and estimated next year's output. Vessel men claim to have contracted for bringing down 3,000,000 tons of the Ore to be mined in 1889 at \$1.35 from Ashland and Two Harbors, \$1.25 from Marquette and \$1.05 @ \$1.10 from Escanaba. The Norrie Mine, in the Gogebic range, has produced and sold almost 575,000 tons of Ore during the past season, including the heavy purchases early last spring by the Chicago Consolidated Steel Company. This company own an immense interest in the Norrie Mine, and for this reason the fact that they have agreed to take 300,000 tons of the Norrie's output next year at a price equivalent to \$5.50, f.o.b. vessels Cleve-

land, is not regarded as in any decided way prognosticating next season's quotations. It is, however, practically settled that \$5.50 will be the opening price for Norrie Ore at Cleveland, and that Gogebic Ores will be offered at \$5 @ \$5.50. Menominee Ores will be offered at about the same figures, with No. 1 Specular and Magnetic Ores quoted at about \$6.25 @ \$6.75 and Red Hematites at \$5.25 @ \$5.60, f.o.b. vessels Cleveland. These are substantially the figures now being discussed by the Ore men. It is reported that concerns in the Mahoning Valley and at Pittsburgh have asked for prices for 500,000 tons of Menominee and Gogebic Ores for next season. Upon the strength of this rumor considerably exaggerated reports of actual transactions have been set afloat which are neither indorsed nor justified by the mine-owners and furnace men. If, however, as now appears quite probable, sales of Gogebic Ore for lower lake delivery are actually made before the beginning of the new year, such transactions will seem to warrant a general advance of about 50¢ per ton over the prices of 1889 for all grades of Ore. The shipping season, which will have terminated in a week or ten days at the most, will end with a record of about 6,775,000 or possibly 6,800,000 tons of Ore transported. The all-rail shipments will carry the totals to about 7,150,000 tons. The shipments to date aggregate 6,710,000 tons, as compared with 4,520,000 tons at a corresponding period last year. Indications are not wanting of a consumption of 1,250,000 tons of Lake Superior Ore east of the Alleghanies in 1889 and of 500,000 or 750,000 tons being demanded in the central West. Many of the vessels now being chartered will unload Ore at Buffalo and Erie next year, thus indicating the heavy demands already being made by Eastern furnace men, and warranting the prophecy that between 9,000,000 and 10,000,000 tons of Ore will be demanded of the Lake Superior mine-owners in 1890.

Pig-Iron.—The market improves in firmness of tone, and \$21.50 @ \$22, cash, at the furnaces is now readily obtained for Bessemer. The furnaces are entirely unable to supply the demand at any price. The inquiry for both Neutral and Red Short Mill Irons and for No. 1 Foundry is remarkably heavy.

Old Rails.—Prices continue to advance and \$27.50 is now demanded for Old Americans, but only very scattering sales have occurred at that figure.

Manufactured Iron.—The demand for Bar-Iron is improving and prices have advanced to \$1.80 @ \$1.85, at which quotations numerous sales are reported.

Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, December 2, 1889.

Pig-Iron.—There is very little of interest to record concerning the course of the local market for Pig-Iron during the past week. An absence of large transactions has not given rise to an easier feeling, but buyers have resisted a further advance with more determination and with the courage of conviction. Where Iron has not been obtained at the present limit of consumers' prices trading has not been indulged in. There is no lack of demand, however. At present Northern and Eastern Iron is selling more readily than the Southern production, because of the difference in price. Southern furnaces, on the other hand, are in a very strong position, being well sold for this year and not a few have liberal contracts covering several months of next year, and as the furnaces in less-favored localities gradually rise to the level which the Southern stacks have assumed a renewal of transactions may be anticipated. The great confidence

entertained by the trade that eventually much higher prices will be made is worthy of attention. At the same time buyers are desirous of postponing the time of advance. It is the belief that after the 1st of January there will be free offerings of Iron from the South, but with buyers, both consumptive and speculative, seeking supplies no reaction is expected. The inquiry during the week has been largely for Gray Forge, with sales of about 4600 tons in lots on a basis of \$17, cash, here, for December, January and February delivery, but sellers generally refuse to sell more under \$17.50, with \$17 bid. Only small lots of No. 1, No. 2 and No. 3 Coke Foundry have been disposed of at \$19, \$18.50 and \$18 respectively. Buyers generally will not bid over 50¢ under these rates. Charcoal Iron has not shared prosperity with Coke Iron, and there is now little difference in price, the former make being comparatively neglected. Car-Wheel Iron has met a better inquiry, with sales of 1000 tons Southern at \$24.50, cash, and small amounts of Lake Superior at \$21, cash. The current prices here at the close, cash, f.o.b., are as follows:

Foundry.

Southern Coke, No. 1	\$18.00 @	...
Southern Coke, No. 2	15.50 @	...
Southern Coke, No. 3	18.00 @	...
Ohio Soft Stone Coal, No. 1	18.00 @	\$18.50
Ohio Soft Stone Coal, No. 2	17.00 @	17.50
Mahoning and Shenango Valley	18.00 @	...
Hanging Rock Charcoal, No. 1	20.00 @	22.00
Hanging Rock Charcoal, No. 2	19.50 @	21.50
Tennessee and Alabama Charcoal, No. 1	19.00 @	19.50
Tennessee and Alabama Charcoal, No. 2	18.00 @	18.50

Forge.

Gray Forge	17.00 @	17.50
Mottled Neutral Coke	16.00 @	16.50
<i>Car-Wheel and Malleable Irons.</i>		
Southern Car-Wheel	24.00 @	24.50
Hanging Rock, Cold Blast	22.00 @	25.00
Lake Superior Car-Wheel and Malleable	21.00 @	21.50

Old Material.—There has been some demand for Old Rails at \$26.50 @ \$27, according to location, while holders have demanded 50¢ advance. Small lots of Virginia light Rails have sold at \$26.25. Old Wheels have been dull and nominally quotable at \$19 @ \$19.25, cash.

Nails.—There has been less demand and freer offerings at previous prices. Iron and Steel Nails, 12d to 40d, sell at \$2.35 @ \$2.45 per keg, with 10¢ rebate in car lots at mill; 50d to 60d at 25¢; 10d, 10¢; 8d and 9d, 25¢; 6d and 7d, 40¢; 4d and 5d, 60¢; 3d, \$1, and 2d, \$1.50 per keg more; Steel-Wire Nails sell at \$3.10 @ \$3.20 for 60d.

Manufactured Iron.—A firm tone has prevailed, but there has been less activity; prices are without quotable change.

Hyatt, Mathews & Gahr have been appointed sales agents for the Trussville Pig-Iron, made at Trussville, near Birmingham.

The partnership between Geo. K. Hosford and H. W. Fischer has been dissolved. The business will be continued by H. W. Fischer under the name of H. W. Fischer & Co., at Room 8, Johnston Building.

Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, December 2, 1889.

Pig-Iron.—It is very difficult to describe the present condition of the market beyond the fact that prices have advanced; there appears to be a very indefinite idea as to the amount. Some parties, both producers and those who have purchased with a view to speculate, are naming a price, but they have none for immediate shipment; others who say that they could make immediate shipment are putting the price at a prohibitory figure; others, again, are naming a more moderate figure and could ship at once, but then comes the inability to get cars. The fact is that the lat-

ter question has been a very important factor in causing the present rise in prices. A letter received but yesterday from one of the largest producers in the South states: "We have been unable to get but a very few cars during the past month. We have large amounts of Iron in our yard, some sold and some not sold, but we are unable to get a car for any distant point, and when we load for points off the local line it is certain to be subject to transfer at the local terminal." This involves a great delay. Often the capacity of the car into which it is transferred is less than the capacity in which it is received and involves a split in the consignment, and the fragment is a long time in going forward and sometimes is charged at local rates. It is evident that if there were facilities for making prompt shipment the strain that is now being undergone would in a great measure be relieved. There are thousands of tons of Iron that are now ready for shipment which could be at once thrown on the market provided the shippers were assured of immediate facilities for moving the same promptly to destination. This condition of things will no doubt continue until the bulk of the cotton crop has been placed in market, which will not be until some time in February or March of the coming year. The nearest report that can be made of the position of prices is to state that sales have been made at \$14 @ \$14.20 for Gray Forge and up to \$16 for No. 1 Foundry at the furnace, f.o.b. Some urgent buyers have paid a little more; at the same time, some sales have been made at less.

Miscellaneous.—The question of furnace building was never so rampant in the South as it is to-day. If all the stacks that are now nearing completion, with those that have been actually commenced, whose companies have been formed and reliable subscriptions made thereto, materialize there will be no less than 31 new furnaces go into blast in the South between now and the 31st of December of the coming year, and nearly all of them are nominally 100-ton furnaces.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., December 3, 1889.

Pig-Iron.—There is little or no change to report in this department. Prices are irregular, but on the whole firm, with very meager offerings. Business for the week has been done for December at prices varying from \$18.75 to \$19.50, delivered, for No. 1 Foundry, \$17.50 @ \$18 for No. 2 and \$16.75 @ \$17.50 for Gray Forge. The asking prices for January and February are \$19.50 @ \$20.50 for No. 1, \$18 @ \$18.50 for No. 2 and \$17 @ \$18 for Gray Forge, according to character of brand, &c. These figures, however, are merely intended as feelers, as only limited quantities are offered. Buyers have made no response so far, the idea being that the quotations named are a little too high to start in with. At any rate, there is a desire to hear from the large companies before acceding to such terms. It is impossible to say what the outcome will be, although, as we have said, there is a strong undertone, but the uncertain attitude of two or three of the Lehigh companies prevents business of importance being done by the smaller concerns. Then, again, some of those who have a little Iron to sell hardly know what they ought to get for it, and in such cases a wide-awake buyer sometimes gets, in slang parlance, a "soft snap." The sale, however, gets talked about and tends to unsettle others who trade in small lots. We say small lots, because neither a buyer nor a seller of large lots is liable to be influenced by a quotation made for a chance

100 or perhaps 200 or 300 tons of Iron. But this is just the kind of market we have to deal with at present, and it is almost impossible to say with certainty what the price of Iron will be for January and February deliveries. Up to this date Glendon and Andover Irons are not quoted in the open market; neither are Cornwall Irons or the Thomas Iron Company's nor any of the Southern Irons. It can therefore be readily understood that if any of the companies mentioned should come out with either a high or low quotation the market would respond at once. It is assumed that the Thomas Company's price will be \$19 for No. 1, at tide, and the Glendon \$17, at furnace. The market is just about in line for quotations of that kind, but at either higher or lower figures immediate readjustments would be necessary on the part of many of the smaller companies. Whether this will be the outcome or not remains to be seen, but at the moment the outlook is certainly favorable to firm if not higher prices.

Foreign Iron.—A sale of 1500 tons 20% Speigleisen was made a day or two ago at \$35, c.i.f., duty paid, Baltimore shipment. To-day's asking prices are \$35.50 @ \$36 for 20% and \$43 @ \$44 for 30% and \$91 @ \$92 for 80% Ferromanganese. *P. S.*—A sale of 1000 tons 20% since closed at \$35.75.

Blooms and Billets.—It is difficult to secure quotations on Steel, as mills are very much crowded with work. Prices, however, are not materially different from last week and may be quoted about as follows: \$36 @ \$37, delivered, for Nail Stabs; \$37.25 @ \$38 for Sheets or Tank-Plate, and up to \$48 or \$50 for the best Boiler-Steel.

Blooms.—Charcoal, \$53 @ \$55; Run-out Anthracite, \$43 @ \$45, and Scrap Blooms, \$34 @ \$35 per Bloom ton.

Muck Bars.—The market is firm and easily 50¢ @ \$1 dearer than last week. There is a great deal of inquiry, but holders are asking \$30.50 @ \$31 at mill. Sales have been made at \$30 at mill within a day or two, and another lot at \$31, delivered, Philadelphia, but they are now held for a further advance.

Bar-Iron.—A little irregularity in prices has been met with during the week. It cannot be said that prices are either weak or lower, but they are irregular. Some of the mills are firm at 2¢, and while 1.95¢ is understood to be a bottom price for carload lots, Western Iron has been offered, delivered here, at less than that, with full extras. These are exceptional cases, however, and are not a fair representation of the market, except as a slight indication of the feeling. But a little falling off in the demand should not cause surprise at this season of the year, and there are always some timid ones who take alarm at the first intimidation of dullness. Of course it may eventually turn out in their favor, but the general idea in the trade is that there will be more demand and better prices after the turn of the year. Skelp Iron is doing a little better, with sales of Grooved at 1.90¢ for December delivery and 2.2¢ asked for Sheared.

Plates.—The amount of business done during the week was not large, but there is a great deal of inquiry and prospects for an active demand are as bright as ever. Prices are unchanged, although some people consider the feeling is a little easier and intimate that they can place orders on better terms than during the week previous. This, however, has not been confirmed by sales at less money, and on the whole the market may be called steady at about the following prices, say: 2.30¢ @ 2.35¢, delivered, for Ordinary Iron Plates and Tank-Plates; 2.40¢ @ 2.45¢ for Universal Plates; Shell, 2.6¢ @ 2.7¢; Flange, 3.25¢; Fire-Box, 3.75¢ @ 4¢; Steel Plates, Tank and

Ship Plate, 2.50¢ @ 2.60¢; Shell, 2.75¢ @ 2.8¢; Flange, 3.15¢ @ 3.20¢; Fire-Box, 4¢ @ 4½¢.

Structural Material.—There is nothing to report beyond a firm and active market. It is becoming clearly evident that the mills will be employed to their fullest capacity for a long time to come, so that new business is not sought for with any degree of anxiety. It is hardly possible to give details of the various contracts taken or that are under negotiation, but they are from all sources and from all classes of consumers. Prices are firm at about the following figures: Bridge Plate, delivered, 2.35¢ @ 2.40¢; Angles, 2.30¢ @ 2.35¢; Tees, 2.7¢ @ 2.8¢; Beams and Channels, Iron and Steel, 3.1¢; Steel Plates and Angles range from 20¢ to 30¢ higher than the same in Iron.

Sheet-Iron.—Business has been a little quiet during the week, but there are so many inquiries coming in and from such a variety of sources that manufacturers are inclined to expect a very heavy demand before long. Stocks are pretty well exhausted, and orders for some sizes have been turned away on account of the difficulty in supplying them in time. Prices firm, and for carload lots about as follows:

Best Refined, Nos. 14 to 20.	3.10¢
Best Refined, Nos. 21 to 24.	3.30¢
Best Refined, Nos. 25 to 26.	3.50¢
Best Refined, No. 27.	3.60¢
Best Refined No. 28.	3.70¢

Common, ½¢ less than the above.

Best Soft Steel, Nos. 14 to 20.	3.1¢
Best Soft Steel, Nos. 21 to 24.	3.3¢
Best Soft Steel, Nos. 25 to 26.	3.5¢
Best Soft Steel, No. 27.	3.6¢

Best Bloom Sheets, ½¢ extra over the above prices.

Best Bloom, Galvanized, discount.	62½ %
Common, discount.	65 %

Steel Rails.—The market has not been very active, but prices are firm, with no concessions whatever from \$35 at mill. Several lots of from 1000 to 2500 tons each have been taken at that figure yesterday and to-day, and other lots are under negotiation on the same basis.

Old Rails.—The market has become very narrow because of the small supply. Prices are very firm, however, and seem like reaching a higher level, as the demand exceeds the supply. There are buyers of T-rails at \$26.50, Philadelphia, or \$27 for D.Hs., but sellers ask about 50¢ more money. Sales chiefly in small lots at from \$27 to \$27.50, delivered in consumers' yards.

Serap-Iron.—The demand is much greater than the supply, so that prices are firm, with a strong upward tendency. Sales at about the following prices: No. 1, \$24 @ \$25 for carload lots, delivered; or for choice, \$25.50; No. 2 do., \$17 @ \$18; Turnings, \$16 @ \$17; Old Steel Rails, \$20 @ \$22; Cast Scrap, \$15.50 @ \$16.50; do, Borings, \$11 @ \$12; Old Fish-Plates, \$27 @ \$28.

Nails.—There is a firm feeling in Nails and higher prices are very generally expected. The demand is therefore larger than usual, but manufacturers discriminate closely in regard to the orders, not wishing Nails to pass into the hands of the speculators. Prices are \$2.20 for Iron and 15¢ @ 20¢ more for Steel.

Wrought-Iron Pipe.—There is no change in prices, but there is a heavy demand, especially for large sizes: Discounts as follows: Butt-Welded Black, 50%; Lap-Welded Black, 62½%; Butt-Welded Galvanized, 42½%; Lap-Welded Galvanized, 50%.

Detroit.

WILLIAM F. JARVIS & CO., under date of December 2, say: There has been little change in the condition of the market since our last report, except perhaps a firmer feeling among producers. The sales have been above the average and for

prompt delivery at outside quotations. Several Mahoning Valley furnaces have withdrawn from the market and cannot book any orders for this year's delivery, and have not yet decided as to their figures for 1890. There is a growing feeling that another advance will take place before January 1. Lake Superior Charcoal furnaces are shipping Iron as fast as made, and in most cases are refusing to quote any price for delivery ahead. Navigation being practically closed, leaves the furnaces that can ship during the winter by rail in shape to take advantage of any advance that may occur. Bessemer is very scarce and quotations are higher by from \$1 to \$2 per ton. With good Irons very scarce and prices firm we quote as follows:

Lake Superior Charcoal, all numbers	\$21.00 @ \$21.50
Lake Superior Charcoal Bessemer	21.00 @ 22.00
Lake Superior Coke Bessemer	22.50 @ 22.75
Lake Superior Coke Foundry, all ore	20.00 @ 21.00
Lake Superior Coke, cinder mixed	18.25 @ 18.75
Standard Ohio Blackband	30.00 @ 21.00
Southern No. 1	18.25 @ 18.50
Southern Gray Forge	16.25 @ 16.50
Southern Silver	16.50 @ 17.00
Jackson County (Ohio) Silver	19.25 @ 19.75
Old Car-Wheels	19.00 @ 19.75
Old Iron Rails	25.00 @ 25.50

St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., ST. LOUIS, December 2, 1889.

Pig-Iron.—The demand does not improve to any extent, as consumers are not willing to contract for supplies at the prices now ruling. It is currently reported that the Southern furnaces are sold up two months ahead, and in some cases even three months' output is already contracted for. Most of the large manufacturing concerns in and tributary to this city are well supplied with Iron, having bought largely during the summer months, when prices were several dollars lower. There are others, however, whose rule is to buy only in small quantities to supply immediate requirements who are almost wholly without Iron, and it is this class of buyers who will feel the advance most keenly. A sale was made during the past week of 1000 tons Missouri Foundry No. 2 at private terms. This was the only transaction that took place that is worthy of note. We quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry	\$19.00 @ \$19.50
Southern Coke, No. 2 Foundry	18.50 @ 19.00
Southern Coke, No. 3 Foundry	18.00 @ 18.50
Gray Forge	17.50 @ 18.00
Ohio Softeners	19.00 @ 19.50
Lake Superior Charcoal	22.00 @ 23.00

Missouri.

Charcoal Foundry, No. 1	18.50 @ 19.00
Charcoal Foundry, No. 2	17.50 @ 18.00

Tennessee.

Charcoal Foundry, No. 1	18.50 @ 19.00
Charcoal Foundry, No. 2	17.50 @ 18.00

Connellsburg Coke, f.o.b. East St. Louis, \$5.25; St. Louis, \$5.40.

Bar-Iron.—This branch of the Iron trade shows increasing strength. Mills have advanced rates to 2¢ and are not disposed to accept orders for prompt delivery even at this figure. Lots from store command 2.10¢.

Barb-Wire.—The volume of business is somewhat restricted, as fence building is not being pushed forward very rapidly on account of the cold weather. Mills are fairly-well supplied with orders, however, and will now have an opportunity of storing some of their product preparatory to the spring trade. On account of the increased cost of raw material prices of Barb and Plain Wire have been advanced 10¢ per cwt. The following prices are now quoted: Painted, from 3.30¢ to 3.35¢; Galvanized, from 3.90¢ to 3.95¢; Carload lots, 10¢ per 100 lbs less than above prices.

Wire Nails.—Mills report an active trade and have sufficient orders booked to keep them busily employed to January 1. In sympathy with Barb-Wire price has been advanced from \$3.15 to \$3.25 rate.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, December 3, 1889.

Pig-Iron.—There appears to be no falling off in the demand, either for Mill or Bessemer, the latter in particular, and since the date of our last report there has been a further advance in prices. Bessemer has advanced more than any other, owing to the fact that there is more demand for it. Ordinarily there is a difference of about \$2.50 $\frac{p}{b}$ ton between Bessemer and Mill Iron, but at present and for some months past there is a difference of double the amount named. About all the Bessemer Iron offered is taken regardless of price, as consumers appear to be impressed with the belief that it will go higher, and they are anxious to cover their requirements as far ahead as possible. From the vast amount that has been sold consumers generally must have anticipated their wants from two up to six months. Considerable stress has been placed upon the report that Carnegie, Phipps & Co. had bought a lot of 2000 tons of Southern Bessemer; but really in the present condition of affairs here it is a matter of but little importance, with the exception possibly that if it turns out satisfactorily it may open up the way for more. As compared with the lowest point Bessemer has advanced in this market from \$7 to \$7.50 $\frac{p}{b}$ ton, whereas Mill Irons have only advanced from \$3.50 to \$4. We quote prices as follows:

Neutral Gray Forge.....	\$17.50 @ \$18.25, cash
All Ore Mill.....	18.50 @ 19.00, "
White and Mottled.....	16.50 @ 17.00, "
No. 1 Foundry.....	18.50 @ 19.00, "
No. 2 Foundry.....	17.50 @ 18.00, "
No. 1 Charcoal Foundry.....	24.50 @ 25.00, "
No. 2 Charcoal Foundry.....	22.50 @ 23.00, "
Cold Blast Charcoal.....	25.00 @ 28.00, "
Bessemer Iron.....	23.00 @ 23.50, "

Muck-Bars.—There does not appear to be much inquiry for immediate delivery or this month, and prices as yet are no better, notwithstanding the increased cost of Pig-Iron; may be fairly quoted for December at \$30 @ \$30.50, cash, with a sale of 1200 tons reported at \$30.25. It is very evident, however, that it will have to go higher, and sellers cannot be found for the first quarter of 1890 at the prices quoted. Pig Iron has advanced fully \$1 $\frac{p}{b}$ ton without change in Muck, but as soon as there is a demand for the latter it will also advance.

Managanese.—The market here is in such an unsettled condition that it is difficult to give reliable quotations. One of our brokers reports a sale of 100 tons of 80% at \$102 at Baltimore, while other sales are reported here for less. A good deal depends upon the delivery, as well as the condition of the buyers; some of the latter have been buying from month to month for some time past, while others are reported as having covered their future requirements pretty well.

Manufactured Iron.—There is a continued fair demand, and prices are firmer. Indications are that there will be an advance early in January, if not before. Mill has advanced fully \$1 per ton within the past two weeks, and it is evident that the products will have to be advanced, sooner or later. We quote as before: Bars, 1.80¢ @ 1.90¢; Plate-Iron, 2.35¢ @ 2.40¢; No. 24 Sheet, 3¢ @ 3.10¢; Skelp, 1.77½¢ @ 1.85¢ for Grooved and 2.10¢ @ 2.15¢ for Sheared. Structural Iron: Angles, 2.45¢; Tees, 2.95¢; Beams and Channels, 3.10¢; Bridge-Plates, 2.45¢; Universal Mill-Plates, 2.55¢.

Nails.—Cut Nails are still quoted at \$2.25, 60 days, 2% off for cash, but manufacturers are only willing to supply immediate actual wants of customers at prices quoted. It is very evident that prices will have to be advanced, in view of increased cost of production. Within the past couple of weeks Nail-Slabs have ad-

vanced fully \$1 $\frac{p}{b}$ ton. Wire Nails are also firmer, but we continue to quote as a week ago at \$3.10 rates.

Wrought-Iron Pipe.—There is nothing new to report in connection with this important branch of the Iron trade; possibly there is not so much new business, but it is not expected at this season of the year; and besides the mills are all fully employed working up former contracts. No change in prices. Discounts on Black Butt-Weld Pipe, 50%; on Galvanized do., 42½%; on Black Lap-Weld Pipe, 62½%; on Galvanized do., 50%; Boiler-Tubes, 1½-inch and smaller, 50%; on 2-inch and larger, 55%; Casing, 5½ inch, 55%.

Old Rails.—Old Iron Rails may be quoted in the absence of sales at \$27 @ \$27.25, cash. There does not appear to be much inquiry at present, but it is expected that there will be an improved demand next month. Steel Rails are in better demand and firmer; sale, 600 tons, at \$23. Brokers expect to obtain an advance over the price quoted of 50¢ @ \$1 $\frac{p}{b}$ ton within the next few days.

Merchant Steel.—There is a very fair demand, and prices are steady as quoted. Tool Steel, according to quality, ranges from 8¢ to 15¢ $\frac{p}{lb}$; Crucible Spring Steel, 4¢; Crucible Machinery, 5¢; Open-Hearth do., 2½¢ @ 3¢; Bessemer do., 2½¢.

Steel Rails.—For heavy sections the price is \$35, cash, at mill, and while we have heard of no recent sales manufacturers here report the market firm at the price quoted. Indeed, the probability is that they will have to go still higher, in view of the enhanced cost of production, as Bessemer Pig has advanced from \$1.50 to \$2 $\frac{p}{b}$ ton within the past two weeks. There is a much larger demand for Bessemer Pig than there is for Rails, which explains the inequalities mentioned, but it is confidently expected that there will be a considerably improved demand for Rails early next year. The margin for profit on Rails is no better now than when they were selling \$8 @ \$9 $\frac{p}{b}$ ton below present prices, as the cost of production has more than kept pace with the advanced prices. The fact of the matter is Rails should be bringing \$1 or \$2 $\frac{p}{b}$ ton more than the price if the enhanced cost of Bessemer Pig was taken into consideration. Either the price of Rails will have to go higher or Bessemer Pig lower, one or the other, and it will most likely be the former.

Billets and Blooms.—Bessemer-Steel Billets and Blooms continue firm and advancing in sympathy with Bessemer Pig. We now quote at \$35 @ \$36; sale of 600 tons Nail Slabs at \$35—the buyer wanted 1500 tons but the seller would only give him 600 tons—and 750 tons Billets at \$35.50.

Railway-Track Supplies.—Dilworth, Porter & Co. quote Spikes at \$2.15, 30 days, f.o.b. cars here; they report a light demand and that they are piling up a considerable proportion of their output. Splice-Bars remain unchanged at 2¢ and Track-Bolts at 3¢ with Square and 3.10¢ with Hexagon Nuts.

Old Material.—Demand fair and prices firm: No. 1 Wrought Scrap, \$22, net ton; No. 1 Wrought Turnings, \$15.50 @ \$16; Old Car-Axes, \$26 @ \$27; Old Car-Wheels, \$20, gross; Cast Scrap, \$15.50 @ \$16; Bloom and Rail Ends, \$22.50 @ \$23.

Louisville.

LOUISVILLE, KY., December 2, 1889.

The market has been quiet during the past week, as almost all buyers have supplied their wants for the present. Prices continue firm, and in view of the demand for Iron elsewhere it is thought that they

will remain steady for some time to come. The offerings of Iron have not been large, as a number of the Southern furnaces prefer waiting until the first of the year before offering Iron for next year's consumption. A few furnaces, however, have made sales deliverable during six months of 1890 at present prices, and buyers believe if others will offer a fair proportion of Iron for delivery extending over four or five months from time to time, instead of coming on the market all at the same time with large offerings, that it will be very much better for both furnace men and manufacturers, as it is felt that the offering of large blocks all at the same time will have a tendency to cause a reaction.

Southern Coke, No. 1 Foundry (new classification).....	\$18.25 @ \$18.75
Southern Coke, No. 2 Foundry (new classification).....	17.75 @ 18.25
Southern Coke, No. 3 Foundry (new classification).....	17.25 @ 17.75
Gray Forge.....	16.75 @ 17.25
White and Mottled, different grades.....	15.50 @ 16.50
Silver Gray, different grades.....	16.25 @ 17.25
Southern Charcoal, No. 1 Foundry.....	18.50 @ 19.50
Southern Charcoal, No. 1 Mill.....	17.00 @ 17.50
Southern Car-Wheel, standard brands.....	23.50 @ 24.50
Southern Car-Wheel, other brands.....	19.25 @ 21.75
Hanging Rock Coke, No. 1 Foundry.....	18.50 @ 19.00
Hanging Rock Charcoal, No. 1 Foundry.....	22.00 @ 22.50
Hanging Rock, Cold Blast.....	24.00 @ 26.00

Financial.

While the general business situation is unchanged there is a more quiet tone usual at this season. In speculative circles more or less disturbance has been caused by the fires in Boston and Lynn, a decision by the Supreme Court of Illinois against the Chicago Gas Trust and disclosures of fraud in connection with Western mortgages, all of which would naturally affect the money market, already in a sensitive condition. The trust decision especially weakens some classes of securities. There were also business failures in Philadelphia, Paterson and Boston. Then came Secretary Windom's decision relating to the withdrawal of bank deposits, which caused a temporary flurry, but bankers were mostly of the opinion that banks would receive more money under its operation than they would have to pay out. Dry-goods jobbers speak of a large volume of orders for the spring trade and much anxiety on the part of buyers to receive at once goods ordered for January delivery. In groceries the feature is the strength of the sugar market. The prices of raw sugar have jumped to the basis of 5½¢ for fair refining and 6½¢ for 96 test centrifugal, on greatly-reduced stocks and steady wants of refiners. Coffees are slow. The cotton movement is quite extraordinary, far ahead of previous years, and large quantities of provisions, grain and other freight have gone abroad from the South and West on through bills, taxing steam-ships to their full capacity and even sailing-ships, two or three of the latter to load with grain, which is noted as a singular circumstance. The New Orleans Cotton Exchange reports that the exports for three months ending November 29 are 232,000 bales ahead of the first quarter of any cotton season during the last 15 years. The clearings of 40 cities for the week ended November 30 showed an increase of 6.5% as compared with last year. The stock market has been weak and irregular, and at the close prices are lower. Thursday was a holiday, and on the resumption of business the bears were uppermost, Chicago Gas and Sugar trusts suffering severely. Several stocks, such as Union Pacific, Chicago, Burlington and Quincy and Atchison, Topeka and Santa Fe, were sold on rumors that the losses by the fire in Boston had disturbed confidence in the ability of capitalists there to carry these properties. On Tuesday there was

a sharp reaction, in which Reading and Lackawanna were the features. The reference to trusts in President Harrison's message was well received.

Government bonds were strong at the following quotations:

U. S. 4½%, 1891, registered.....	104½
U. S. 4½%, 1891, coupon.....	104½
U. S. 4%, 1907, registered.....	128
U. S. 4%, 1907, coupon.....	127
U. S. currency 6%.....	116½

Banks and trust companies loaned money a little more freely, but others who had money to lend declined to put it out for shorter periods than five months, and consequently there were no quotations for short-time money. Commercial paper was in a little better demand. Owing to the dearness of money the posted rates for sterling were reduced to \$4.81 @ \$4.85½.

The bank statement showed an increase in reserve of \$406,650, which brings the surplus up to \$1,891,650 above the 25% required by law. The items show an increase in every case except circulation, which is down slightly. The banks gained \$433,000 in specie and legal tenders. Loans increased \$774,000 and deposits \$105,400.

Secretary Windom announces that he has decided to reduce the number of national bank depositories and the amount of public moneys kept therewith, but that it is intended to make this reduction in such a manner as to avoid as far as possible any disturbance to the business of the country. A transfer to the Sub-Treasury on or before January 15, 1890, of about 10 per cent. of their holdings of public moneys will be required from banks having in active accounts about 10 per cent. of the surplus held by them over and above the amount needed for the convenience of the public service; or, if the banks wish to sell to the Government the bonds furnished as security for these deposits, the Secretary will purchase them and retain from the proceeds of sale the amount which otherwise would have to be deposited, sending checks to the banks for the residue. Other calls will be made from time to time, but always with due regard to business interests, until the public moneys with the banks shall have been reduced to the amount needed for current public business, and the money withdrawn will be used for the purchase of United States bonds. Banks desiring to dispose of the entire amount of bonds furnished as security for public deposits will not, of course, be limited to the 10 per cent. transfer of the first call.

The total amount of the Government deposits in banks is now about \$47,000,000. The banks of this city have on deposit with the Treasury Department, to secure public money, \$5,907,000 of United States bonds, and a large part of the deposits secured by those bonds come under the head of accounts of disbursing officers, the amount required by the Treasury from New York banks on or before January 15 cannot be in excess of \$500,000, and therefore without significance as a disturbing factor.

The debt statement shows an apparent decrease of the debt during November of \$4,869,672, and for the five months ending November 30 of \$20,565,616. The amount of the 4½ per cent. bonds outstanding is now \$124,413,000 and of the 4 per cents. \$639,531,100. The surplus in the Treasury is given as \$40,249,187. Secretary Windom's estimates of Government expenditure for the current fiscal year make an aggregate of \$323,500,000, or \$18,000,000 in excess of those of the previous year.

The silver market was stronger, the Government bidding 97 cents per ounce, the highest in many years. The price in London 2d inst. was 41½d per ounce; parity in New York, \$0.9690. On May 19, 1888, the price of bar silver in London was 41½d, the lowest recorded up to that time. The

silver convention at St. Louis did not come up to expectation. The attempt to make the Government a compulsory purchaser of bullion, while providing at the same time for the free coinage of silver legal-tender dollars, carries with it the impression that the convention did not feel sure of.

The President's message for the moment commands attention. He recommends revision of the tariff, but is vague as to the scope of the changes desired, and in regard to silver he speaks with reserve. He regards Government bank deposits as "an unauthorized and dangerous expedient," besides being unconstitutional. Conservatism is the prevailing characteristic.

Exports for the week at New York were valued at \$4,107,790 and the imports were \$7,450,000. Since January 1 the exports, exclusive of specie, amount to \$317,022, 674 and the imports to \$459,732,663, as compared with \$274,871,654 and \$427,761,309 respectively for the same time last year.

Metal Market.

Copper.—London has on the whole been steady. On November 28 the quotation for spot was £49. 17/6 and for futures £49. 15/; to-day it is respectively £50 and £49. 15; sales during the week, 2400 tons. In our own market the consumptive demand has been moderately active, but Copper is held so firmly that it has sufficed to raise the price to 14½ @ 14½ Lake, and 12½ @ 12½ casting brands. About the Anaconda fire, we read in the *Butte Miner*: "Orders were given by the superintendent to bulkhead the drifts and close up the shafts of the Anaconda and St. Lawrence mines. The drifts of the latter as far down as the 500-foot level were bulkheaded, but in the Anaconda the heat was so fierce as to prevent any attempt to descend below the 400-foot level, and accordingly the shaft was boarded over at that level. The connecting drifts between the two mines were securely closed at the St. Lawrence exit, and all draft was cut off. It was hoped to smother the fire in this way, but later the confined gas exploded and forced the bulkheads out, thus giving the fire access to all the levels, where it may burn for weeks." It is reported per cable from Paris that the Tamarack Mining Company lost an action for damages against the Comptoir d'Escompte and Société des Métaux for breach of contract, on the ground that the securities given were not in accordance with the Comptoir's statutes.

Tin.—On November 28 the London market stood £95. 17/6, spot and futures. It is cabled to-day £98 and £97. 10/ respectively. The sales aggregated in the meantime 640 tons. Our own market relapsed into a rather dull mood, quotations undergoing but slight fluctuations, and closing to-day as follows: Spot, 21.45@ 21.50¢; prompt shipment, 21.40¢, and January to April futures, 21.40¢ @ 21.55¢. At the Metal Exchange in the forenoon 20 tons March brought 21.50¢, 20 spot 21.45¢ and 10 ditto 21.50¢.

Tin-Plates.—The demand has been moderate and prices for spot goods are without material change. Some orders have been sent out for delivery running into next year, based on present prices, but are declined by makers, who ask 1/ per box advance. They seem indifferent about entering orders even at this advance, on account of the uncertainty about the future course of prices of Steel Bars. We quote at the close, per box: Siemens-Martin Steel, Charcoal finish, \$5.50 @ \$6; Coke finish, \$5.20 @ \$5.25; Coke Tins, Penlan grade, \$4.85; J. B. grade, \$5, and Wasters, \$4.75 @ \$4.80.

Lead.—Some 300 tons Common Domestic were sold, mostly in a jobbing way, at

3.80¢ @ 3.85¢, the closing quotation on a firm market 3.80¢ @ 3.87½¢. At St. Louis some 600 tons were sold at 3.60¢ @ 3.62½¢, and 3.65¢ is now asked out there, 3.67½¢ at Chicago.

Spelter.—The market has been moderately active, but very firm, some 50 tons changing hands at 5.90¢, and 5.35¢ being asked by holders at the close. Silesian remains 7¢ nominally.

Antimony.—The scarcity, coupled with a continued good demand, has raised the price for Cookson to 32¢ @ 33¢, and that for Hallett to 22¢ @ 23¢, nominally.

New York Metal Exchange.

The following sales are reported:

FRIDAY, November 29.	
16 tons Lead, December.....	3.85¢
16 tons Lead, January.....	3.87½¢
500 tons Iron, spot.....	\$18.00
10 tons Tin, spot.....	21.30¢
10 tons Tin, January.....	21.35¢
10 tons Tin, February.....	21.35¢

SATURDAY, November 30.	
25,000 lb Lake Copper, January.....	14.20¢
100 tons Iron, January.....	18.25

MONDAY, December 2.	
200 tons Iron, February.....	\$18.75
100 tons Iron, January.....	18.25

TUESDAY, December 3.	
25 tons Tin, December.....	21.40¢
WEDNESDAY, December 4.	
25,000 lb Lake Copper, February.....	14.30¢
25,000 lb Lake Copper, March.....	14.30¢
50,000 lb Lake Copper, March.....	14.25¢
20 tons Tin, March.....	21.50¢
10 tons Tin, spot.....	21.45¢
10 tons Tin, spot.....	21.50¢
30 tons Tin, March.....	21.55¢
100 tons Tin, March.....	21.45¢

Coal Market.

A cold snap from the Northwest encourages Coal operators to look for an improved demand forthwith, but thus far in the season there is little relief from the lethargic dullness which has formed a standing complaint. The only cheering sign is the increased consumption of Furnace sizes arising from the activity of the manufacturing industries—especially in bridge-building and demands for shipbuilding material—and it is intimated that an early advance in the price of Steam-Boat and Broken is not improbable. Whether this can be accomplished in face of the reduced demand since the close of lake navigation remains to be seen. The Reading Coal and Iron Company are now working 39 of their 46 active collieries. On Friday the Consumers' Coal Company, a co-operative concern, doing business in this city for the last eight years, suspended with liabilities of about \$40,000, nominal assets about \$65,000. Seven judgments were entered against them in favor of Mrs. H. C. Schenck, wife of the president, for \$12,159, and one in favor of M. Briggs for \$696. The other creditors are mostly wholesale Coal-dealers. The company quotations remain as follows: Broken, \$3.90; Egg and Chestnut, \$4.15; Stove \$4.40.

Respecting statistics of production the Philadelphia *Ledger* says: "The seven Coal producing and carrying corporations which control the Anthracite trade have about completed arrangements to cut off from the public, if not from each other, all official intelligence of their respective tonnages. The latest development in this respect is that the Delaware and Hudson Canal Company whose tonnage thus far this year has run 500,000 tons behind that of last year, have joined with the Lackawanna road in omitting their weekly statements. We are reliably informed that it is also the intention of some of the other Anthracite roads to follow in that direction. The Reading, Jersey Central, Lehigh Valley and New York, Lake Erie and Western railroads appear to have profited very largely this year at the expense of the Delaware, Lackawanna and Western, the Delaware

and Hudson Canal, the Pennsylvania Railroad and the Pennsylvania Coal Company."

Bituminous Coal has been scarce and in demand in consequence of flooded mines and interrupted transportation, but relief has come through the resumption of shipments from the Beech Creek region. Cumberland shipments for the week ending November 26 were 67,000 tons, and for the year to date 2,789,800 tons.

Arrangements have been made by all the Coal operators of the Monongahela Valley to close down their mines indefinitely, as the demands of the miners cannot be conceded.

The Delaware and Hudson Canal closes December 20.

A Pottsville letter speaks of hard times among the miners caused by scant earnings and the unremunerative prices of Coal. "The summer schedule of prices, \$2.60 for ordinary domestic sizes at Schuylkill Haven, has been shaded as low as \$2.40, but still trade is lifeless. The output thus far this year is nearly 2,500,000 less than last year, yet the stock at tide-water is far beyond the needs of the general trade. Among the large workings now idle (November 30), may be mentioned the Cameron and Lake Fidler about Shamokin. Over 2000 men in that district are idle. The Draper and Gilberton collieries are also shut down. The Hickory Swamp Colliery of W. L. Scott is not in operation. Wages have been very severely cut."

George Wiggan, probably the oldest Coal operator in Pennsylvania, died in Germantown last week, aged 89 years.

New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, December 4, 1889.

American Pig.—The market is quite active and a very considerable quality of Iron could be placed if the furnaces were willing to contract freely for 1890 delivery. In one case, for instance, a consumer asked for a price on 8000 tons for delivery during next year to cover a contract for manufactured goods. Some of the Northern furnaces are booking for the first quarter of 1890 on the basis of \$19 for No. 1, quite a considerable business being done in the aggregate. No 2 is relatively scarce. Southern No. 1 for early 1890 delivery is selling in a small way at \$19.50 @ \$20. The Boston market is particularly bare of Iron, being more dependent upon Southern Iron, the deliveries of which continue very unsatisfactory.

Spiegeleisen and Ferromanganese.—During the week a large Western steel-mill has purchased considerable blocks of 20 % and some 30 % Spiegeleisen, for delivery during the second quarter, at private terms. It is intimated that the price paid was \$35.50 and upward, a number of sellers having participated. There is a continued demand for Ferro manganese, the price depending largely upon the urgency of the buyer.

Billets.—In the East there have been no sales of any consequence. From the West a sale of several thousand tons, for Cleveland delivery, at \$35.75, delivered, is reported, a Wheeling mill being the seller.

Rods.—There have been some sales of 500-ton lots of domestic on the basis of \$34 @ \$35, New York.

Steel Rails.—The market is very quiet, the majority of the mills adhering to the "pegged" price of \$35, at which, however, no transactions are reported. One of the Eastern mills has offered to sell during the week at \$34.75, at tide-water, which is equivalent to \$34 at mill. The offer, however, did not lead to business. This being the only circumstance which has come up during the week to serve as an indication

of values, we quote \$34 @ \$35 at Eastern mill.

Manufactured Iron and Steel.—No transactions of any moment are reported. Universal Mill Plates are quoted 2.25¢ @ 2.3¢, while Iron Angles are 2.25¢ @ 2.30¢; Tees, 2.75¢ @ 2.8¢, and Beams, 3.1¢, on dock. Shafting Steel is selling at 2.25¢. Bars are quiet at 1.9¢ @ 2¢ for Refined.

Old Rails.—There has been no business in domestic Rails, which are quoted nominally \$24.50 @ \$25. An order for 6000 tons foreign Doubles, for delivery during the first half of 1890, is in the market, but cannot be filled at less than \$27, Philadelphia.

Track Material.—The demand is very light. Prices remain nominally \$2.20 @ \$2.30 for Spikes; 2 10¢ @ 2.20¢ for Angles and 3¢ @ 3.25¢ for Square Nuts.

Benjamin Watson, 40 Wall street, who has been connected for many years with George Evans, has issued a circular calling attention to his facilities for furnishing Rails, Rail Fastenings, Locomotives and Cars.

Imports.

Hardware, Machinery, &c.

Arnstedt & Co., Mach'y, pgs., 7; ditto, cs., 3
Auffmardt, C. A. & Co., Mach'y, pgs., 5
Boker, Hermann & Co., Arms, cs., 39
Clark, G. A. & Bro., Mach'y, cs., 10
Curley, J. & Bro., Cutlery, cs., 2
Field, Alfred & Co., Mdse., cs., 10
Folsom, H. & D. Arms Co., Arms, cs., 10
Godfrey, Chas. J., Arms, cs., 6
Godwin, Samuel & Sons, Gun Barrels, cs., 4
Garvin, E. E. Co., Mach'y, cse., 1
Hartley & Graham, Mdse., cs., 18
Hussa & Co., Hardware, cs., 6
Haynes, C. A. & Co., Stoves, pgs., 74
Koising & Co., Hardware, cs., 4
Keating, T. F., Mach'y, cs., 12
Louiza, H., Mach'y, cse., 1
Lau, J. H. & Co., Arms, cs., 9
Mathews, J., Mach'y, pgs., 3
Newton & Shipman, Files, cks., 3
Outerbridge, A. E., Iron Gutters, crates, 2
Overton & Co., Mach'y, pgs., 5
Pim, Forward & Co., Dutch Stoves, 119
Sacks & Richmond, Castings, cks., 14
Schoverling, Daly & Gales, Arms, cs., 32
Spaulding, E. P. & Co., Mach'y, cse., 1
Sheldon, G. W. & Co., Mach'y, cse., 1
Smith, W. O., Mach'y, cs., 4
Strauss, Adolph, Hardware, cs., 4
Taylor, Thos., Mdse., cs., 6
Thebaud Bros., Screws, kegs, 5
Ward, Jas. E. & Co., Mach'y, cs., 36
Werleman, H., Arms, cs., 30
Wiebusch & Hilger, Lm., Mdse., cs., 35
Order—Mach'y, cs., 12; Nails, kegs, 140; Dutch Stoves, 500; Mach'y, pgs., 52

British Iron and Metal Markets.

[Special Cable Dispatch to *The Iron Age*.]

LONDON, WEDNESDAY, December 4, 1889.

Copper has been irregular but strong. The advance on Wednesday of last week to £50 for Merchant Bars led to considerable realization by the bulls, and under the anxiety to take profits prices reacted. The offerings were well absorbed, however, and the market regained strength. Consumers purchased freely, and Birmingham firms and buyers for the Continent operated heavily. Smelters are reported to be comparatively bare of stock. It is believed that the adoption of the new smokeless powder by the German Government will lead to a large increase of consumption of Copper in the manufacture of cartridge-cases. The report has circulation that the Cape Company and other London-owned mining concerns have sold their entire stock, and German representatives are said to have contracted for the greater part of the entire production for months ahead. If the German Government adhere to the new powder it is believed that the requirements of Copper for cartridge manufacture will be equal to nearly the entire

European production. Secret negotiations have, it is reported, been carried on by the French Government, and their agents are said to be endeavoring to secure any supplies that the Germans have not monopolized. The stock originally held by the late syndicate has been reduced 60,000 tons in eight months, and it is believed that a further considerable reduction of the holdings will be made without bad effect upon the market. The stock remaining unsold is held by four bankers. The Chili charters for the month are wired as 2700 tons. The visible has decreased 4000 tons.

Copper furnace material has been active and prices for all descriptions have advanced sharply. James Lewis & Son's record of transactions for the past fortnight includes 100 tons Montana Matte at 9/; 500 tons ditto at 9/3; 150 tons ditto at 9/6; 150 tons ditto at 10/; 200 tons ditto at 10/3; 170 tons ditto, private terms; 700 tons Anaconda Matte at 9/4; 200 tons ditto at 9/6; 200 tons ditto at 9/9; and 500 tons ditto at 10/; making a total of 2870 tons American Matte and a rise of 1/ per unit in the price.

Tin has been irregular. The trade and consumptive demand continues good, but speculative business has shown little spirit. Early in the week sales were made at £96. 15/, but freer offerings set the market back to £95. 12/6. At that decline there was a pause in the selling movement and a quick recovery to £93. 5/ took place, which, in turn, was followed by a rise to £97. 10/ at the close on Tuesday and to £98 to-day for spot.

Tin-Plate has been quiet. Only a small business is reported and buyers are holding back, being influenced by the decline in Iron prices. A few lots of Bessemer Cokes were sold at 16/6. Makers are very busy on orders and firm, but outside holders sell at a fraction under their figures.

The Pig-Iron market has continued excited. Large transactions have taken place in Scotch and Hematites at receding prices. Free sales were made by holders desirous of realizing and also for "bear" accounts. Cleveland Pig-Iron has been quiet, but prices have dropped. Makers' brands of Scotch have been down somewhat from the prices ruling a week ago, but a recovery on most brands has taken place the last few days. Cleveland Pig has also moved back to within 2/ of last Wednesday's price, although selling considerably lower in the interior, and Hematites show 1/6 advance, although quoted at 73/6 at one time. Steel Rails are again back to £6.17/6 for heavy sections, after having been quoted at £6. 15/, and Billets, Slabs and Blooms are firmer to-day than they were on Monday. On prices for Manufactured Iron there has been no radical change, except for Black Sheets, which are held at 5/ advance.

Scotch Pig.—Makers' brands less active this week than last, but prices firmer at the close in most instances.

No. 1 Coltness, f.o.b. Glasgow	79
No. 1 Summerlee, " "	78
No. 1 Gartsherrie, " "	79
No. 1 Langloan, " "	78
No. 1 Cambro, " "	82/6
No. 1 Shotts, " at Leith	78/6
No. 1 Glengarnock, " Ardrossan	77/6
No. 1 Dalmellington, " "	70
No. 1 Eglinton, " "	70/

Steamer freights, Glasgow to New York, 2/;

Liverpool to New York, 10/.

Cleveland Pig.—There has been only a fair business. Prices have declined, but

reacted, and are firm to-day, with No. 3 Middlesborough quoted 64/6 @ 65/ for prompt.

Bessemer Pig.—Realizations caused a sharp decline, but the demand has since improved. Prices are stronger. West Coast brands, mixed numbers, 76/, f.o.b. shipping point.

Spleteleisen.—There continues to be a fairly active demand and the market is strong. English 20% quoted 95/, f.o.b. at works.

Steel Rails.—Demand has been active and the market strong, with prices 2/6 better than last week. Heavy sections quoted at £6. 17/6 and light sections £7 @ £7. 10/, f.o.b. at N. W. England shipping point.

Steel Blooms.—In these there has been a quite large business, but at some what lower prices. We quote £6. 5/ for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—The market firm and demand fairly active. Bessemer, 2½ x 2½ inch, £6. 10/, f.o.b. at N. W. England shipping point.

Steel Slabs.—Sales were made at a slight decline last week, but the market is now 2/6 better. Bessemer, £6. 2/6, f.o.b. at N. W. England shipping point.

Old Rails.—There is little doing in this line and prices are nominal. Tees quoted at £3. 10/ @ £3. 12/6 and Double Heads £3. 12/6 @ £3. 15/, f.o.b.

Scrap-Iron.—The market quiet and without change. Heavy Wrought quoted £3 @ £3. 2/6.

Crop Ends.—But little doing and prices nominal. Bessemer quoted £3. 12/6, f.o.b.

Tin-Plate.—Business moderate at present and prices somewhat irregular. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade.....	18/
IC Bessemer Steel, Coke finish.....	16/6
IC Siemens " "	16/9
IC Coke, B. V. grade.....	16/
Charcoal Terne, Dean grade.....	15/9 @ 16/

Manufactured Iron.—There is a fairly active demand. Prices firm, with 5/ advance on Black Sheets. We quote, f.o.b. Liverpool:

	£ s. d.	£ s. d.
Staff. Marked Bars.....	9 10 0 @ 0 0 0	
" Common.....	8 0 0 @ 8 5 0	
Staff. Bl'k Sheet, singles.....	0 0 0 @ 9 15 0	
Welsh Bars (f.o.b. Wales).....	7 12 6 @ 7 17 6	

Copper.—The market strong and fairly active. Chili Bars quoted at £50, spot, and £49. 12/6 @ £49. 15/, three months' futures. Best Selected, £57 @ £57. 10/.

Tin.—Business quite active and the market strong. Straits quoted at £98, spot, and £99. 15/ for three months' futures.

Spelter.—The market firm, with demand good. Quoted at £23. 10/ for Ordinary Silesian.

Lead.—There is more doing and the market is stronger. Quoted £14. 15/ for Soft Spanish.

Coke having been advanced to \$1.75 at the ovens in the Connellsburg region, it now costs Chicago furnaces \$4.50 per ton of 2000 pounds delivered, railroad freight being \$2.75. West Virginia coke is being laid down in Chicago at the present time at \$4.20 per ton of 2000 pounds, and is said to be proving a very satisfactory furnace fuel.

MARKETS BY TELEGRAPH.

WEDNESDAY AFTERNOON.

Cleveland.

The Ore situation has wholly changed within the past three days. Disregarding the usual custom of waiting for the annual meeting of their companies, the Ore men are to-day selling large blocks of Bessemer Ore, both hard and soft, for next season's delivery. For 1000 tons of a particularly high grade Hematite \$6, f.o.b. vessels Cleveland, was paid. The average advance over last season's price, however, is about 60¢ or 70¢. The sales made since Monday are believed to aggregate not less than 600,000 or 700,000 tons, exclusive of the Chicago purchases. Only Bessemer Ores are being asked for, the Steel manufacturers apparently seeing their way clear for next season. Intense excitement prevails among the local agents, and it is claimed that 3,000,000 tons of Ore will have been sold before the holidays at from 50¢ to 75¢ advance over the prices for this season and all for lower lake delivery. Heavy sales of Gogebic Ore are reported to-day at \$5.50, Cleveland delivery. The demand for Bessemer Iron is heavy and sales have been made at the furnace at \$22.50, spot cash.

Pittsburgh.

The Iron market is firm; Gray Forge for January and February is \$18 @ \$18.50, cash, and Bessemer Pig, same delivery, is held at \$24 @ \$25, cash. December delivery can be had considerably below prices quoted. Muck Bar is selling for January and February at \$31 @ \$31.50, cash. All kinds of Finished Iron and Steel are firm and will go higher.

Philadelphia.

The entire market shows great strength and prices for January and February are all higher. Plates are particularly strong, but in this respect there are no exceptions. There is a great deal of inquiry, showing that consumers' requirements will be very heavy in the near future.

St. Louis.

There is no change to report in the conditions governing the Pig-Iron market. Prices are firm, but as the end of the year is approaching consumers are loth to place orders for any considerable amount, hence lots of from 50 to 100 tons are considered the maximum. The Tennessee Coal, Iron and Railway Company have named the following prices, to take effect at once, f.o.b. cars Birmingham: No. 1 Foundry, \$16; No. 2, \$15.50; No. 3, \$15; Gray Forge, \$14.50.

Chicago.

Pig-Iron prices continue to harden. A sale of 500 tons Southern Gray Forge is reported at equivalent to \$18.80, Chicago. Lake Superior Charcoal is in more demand, and sellers find the market coming more under their control. With Bessemer Pig worth \$23 they are disinclined to sell Charcoal at \$21 or \$22, but will turn in on Bessemer. Orders for Bar-Iron are coming forward all the time, and sales are made at 1.90¢ @ 1.95¢, according to specification. Trade in Railway Track Supplies, except Rails, is particularly good this week. Nails are unchanged, but Barb-Wire has been ad-

vanced 10¢ @ cwt. by the manufacturers, who now ask 3.35¢ for small lots and 3.25¢ for carload lots of Painted, with 60¢ more for Galvanized. The demand for Hardware is so heavy that jobbers are working clerks and packers at night. Old Rails and Scrap are quiet, but Rails are firmly held, while Scrap is weak.

Cincinnati.

The local market for Pig-Iron has again sprung into activity, accompanied by increased strength and confidence, with higher prices obtained. At the moment there is some excitement, in sympathy with the news from Pittsburgh reporting an advance to \$24 for Bessemer Iron. A few consumers are apparently alive to the situation and have secured supplies, conforming to the views of furnaces, but the majority of buyers are resting securely behind supplies already bought or are stolid in the occupancy of former mental position. Northern furnaces are selling freely and have about reached the level which Southern stacks held about four days ago, while some of the larger Southern companies have advanced another step, being fortunate enough to secure their ground by material sales at prices 50¢ higher than could have been obtained last Saturday. Sales yesterday and to-day of Ohio and Virginia Gray Forge amounting to about 5000 tons have been made on the basis of \$17 @ \$17.25, cash, here, for December, January and February delivery. Three thousand tons Southern Gray Forge and Mottled have been sold at \$17.55 and \$17.05 respectively, cash, for February and March delivery; also 3000 tons Soft Southern Coke on the basis of \$18.50 for No. 3. This Soft Iron, however, will remain in the South.

Foreign Markets.

SPAIN

BILBAO, November 9, 1889.—**Iron Ore.**—A good deal has been done during the week both on the spot and for forward delivery next year at 8/4 @ 8/5 Rubios on the spot and 8/6 @ 8/9 futures, the asking price for the latter now being 9/ and 11/ for Campanil, the latter still tending upward, because it is scarce and the mines are getting exhausted. Freights are stiff. Ore shipments were 75,371 tons for the week, and since January 1 3,320,383, against 3,174,902 in 1888 and 3,717,051 in 1887. The week's export of Pig-Iron was 700 tons; coastwise 1832 tons were shipped. Shipments of Ores and Metals from Spain during the first nine months have been as follows:

	1887.	1888.	1889.
	Tons.	Tons.	Tons.
Calamine.....	20,698	23,105	19,069
Pyrites.....	504,779	629,000	624,810
Iron Ore.....	4,262,415	3,599,475	3,817,255
Pig-Iron.....	89,488	48,950	55,125
Precipitate.....	19,499	21,239	23,737
Quicksilver.....	1,118	875	1,708
Pig-Lead.....	99,168	97,917	98,581

Totals..... 5,087,165 4,421,191 4,640,285

The decrease in Calamine and increase in Quicksilver will be noticed.—*Bilbao Marítimo y Comercial*.

SWEDEN

STOCKHOLM, November 22, 1889.—**Iron.**—Our market has continued active and rising on the spot; producers decline selling any further for forward delivery next year. For November-December delivery the prices of Pig are 3.10 crowns, of 28¢ American, 3 42½ kg., Nora brand, and 3.50 Warmland brand. Finished may be quoted 6.10 crowns on the spot and 6.40 to arrive.—*Dagbladet*.

BRAZIL

PARA, November 29, 1889.—**India Rubber.**—The November receipts to date are 1245 tons. Prices for Island fine have further advanced 50 reis, being now 2100 reis, and Exchange advanced to 27 11-16d. Stock on hand 50 tons.—*Per cable direct*.

Hardware.

The market presents few new features. The advanced prices are regularly maintained, and the market in all heavy goods is characterized by continued firmness. Manufacturers in general Shelf Hardware are pursuing a conservative course in not announcing advances until the situation justifies them, recognizing that the statement of increased prices from which they should soon be obliged to recede would have an injurious effect. Many lines of goods the material of which costs more than heretofore are accordingly being sold at former prices. In a number of lines, however, the increased cost of iron and tone of the market in other metals has required slight advances. The market as a whole has, therefore, an improved tone, and manufacturers are keeping their business in such shape as to be prepared for an advance if it should occur.

Wire Nails.

There has been little change in the condition of the market. The demand continues good, and prices are well maintained. The regular quotation is \$3 at factory for carload lots, a figure which is only shaded in exceptional cases and is firmly adhered to by many of the mills.

Before Miscel. Prices

Cut Nails.

Considering the season, the movement of Cut Nails is satisfactory, prices remaining \$2.10 for Iron Nails, in carload lots on dock, New York.

Federal Steel Company.

The difficulty to which we referred in our last as encountered in the organization of the Federal Steel Company has not been overcome and the whole matter is at present in an unsettled state. Under the skillful and energetic management of those who are active in the movement an understanding had been reached with almost all the manufacturers in the country in the lines to be controlled, but at the last some of them desired a revision of valuations. This was not considered feasible and the scheme in the form contemplated has been abandoned. It is, however, probable that a Federal Steel Company will be organized, but that instead of having the comprehensive scope which was originally intended, giving control of the market in the lines affected, it will probably be simply a consolidation of the interests of some of the manufacturers.

Miscellaneous Prices.

Another advance has been made by the manufacturers in the prices of Loaded Shells. This is the third which has been made within a short time. The demand for these goods has been and continues large, and the trade have a good deal of difficulty in getting them as fast as required. The jobbing trade have pretty generally made corresponding advances in their prices, though the goods can often be bought at lower prices from them than from the manufacturers.

An advance has recently been made in Stove Hollow-ware, ground and unground, of about 7½ per cent. The market is very firm at the new quotations.

The National Cordage Company have succeeded in bringing about an agreement with some of the outside manufacturers of Manila Rope, and in consequence of this an advance has been announced. Prices of Sisal remain without change.

The Sand-Paper manufacturers are understood to be considering the feasibility of forming an association which shall give

them firm control of the market. There is some question as to the willingness of one or two outside parties to enter into such an agreement.

Prices of Tacks are referred to as regularly maintained under the new arrangement. The strength of the market has much to do with this regularity. It is also thought not unlikely that it may be found feasible to make another advance on account of the continued strength in the prices of the raw material.

The manufacturers of Screws report a heavy demand for their goods, indicating the impression on the part of the trade that an advance is not unlikely on account of the high prices ruling for Wire. The satisfactory working of the agreement between the different companies is also referred to as putting them in a position to maintain an advance if it should be decided on.

L. A. Sayre, Newark, N. J., who makes a large and varied line of Ice-Creepers, is quoting them at the following prices:

Rival	Per doz.	\$1.50
Climax	"	1.25
Security	"	1.25
Instep	"	1.75
Surefoot	"	1.75
Mackinaw	"	2.00
Jamestown	"	5.50
Hudson River	"	6.00
Eclipse	"	1.50

He is also sending out two cards of special shape, one of which when placed by the side of the other appears the larger, but when the positions are reversed the one that appeared the larger seems to be the smaller of the two. They are, however, precisely the same size.

Malin & Co., Cleveland, Ohio, announce the following prices on their Spooled Wire:

	Discount
Annealed and Tinned	50 %
Brass and Copper	40 %

The Copper and Brass Tube manufacturers held a meeting yesterday and advanced the price of Tubing as follows:

Brass	2 cents over old list.
Copper	3 cents over old list.

Peter Wright & Sons announce another advance in the price of their Anvils of ½ cent per pound. This is the third advance made this fall and indicates the strength of the English market for such goods.

Both the German and English markets are characterized by exceptional strength for many lines of goods, especially in Heavy Hardware. Belgian Guns and Rifles have also been advanced, and the market in these goods is regarded as very firm.

The following from the last issue of the *Ironmonger* refers to the condition of trade in Sheffield:

The tide of trade continues to flow rapidly into this district. The season trades are unusually active, and leading firms will experience difficulty in getting out their orders before Christmas. Tools are in increased request, although this is usually a dull part of the year for that branch. The rolling-mills are pressed with orders, and engineering establishments are generally busy. Raw material continues to advance in value.

Obituary.

Announcement is made by Ward & Payne, the well-known manufacturers of Sheep-Shears, &c., Sheffield, England, of the death of their senior, Mr. David Ward, on the 18th ult. Mr. Ward was in vigorous health at the time of his death, which was very sudden. He was born on the 6th of December, 1834, and was therefore in the fifty-fifth year of his age. Mr. Ward had been from an early period connected with the above firm. His grandfather was the founder of the establish-

ment, and upon his death in 1822 the business passed into the hands of his son, who prior to his death in 1842 admitted Henry Payne into partnership. At the time of his father's death Mr. Ward was but eight years old, and owing to his minority the business was conducted for some years by trustees. When he at length assumed active control of the firm its development was very rapid and gratifying. The business was largely extended and new lines of manufacture added. The Carving Tool trade of S. J. Addis, of London, was purchased, and these goods soon occupied a high place in the market. The manufacture of Sheep-Shears was subsequently undertaken and their introduction energetically pushed until the product of the firm acquired a world-wide reputation. Another important extension was the manufacture of Spades, Shovels, and similar goods at Limbrick Wheel. In the management of the varied departments of this large establishment Mr. Ward displayed rare abilities, and the present high standing of the firm is largely due to his untiring industry and indefatigable enterprise. Mr. Ward, after serving the office of Senior Warden of the Cutlers' Company, was installed Master Cutler in 1877, which office he might have held at a much earlier date, but the honor was declined by him. Mr. Ward was also elected to various municipal offices in Sheffield, and was at one time its mayor. The duties of these several positions were discharged with honor and credit and a painstaking fidelity to the best interests of his constituents. Mr. Ward's devotion to business was tempered by a rare love for sport. He was an excellent shot and spent much of his leisure time in shooting at his moors at Lady Cross. Mr. Ward was much devoted to his family, a man of marked benevolence and conscientious purpose, and his death will be mourned by a very numerus circle of friends.

The Export Trade.

An importer in the Australian colonies, writing to a manufacturer in this country, complains bitterly of the way the American export commission-houses with few exceptions "pull at both ends of the string." He says: "We are utterly unable to comprehend the business methods employed in your country. We pay say 2½ per cent. commission to these export buyers to purchase goods for us at lowest possible prices and have a contract with them to that effect, yet notwithstanding this we have positive proof that in a great many cases they obtain from the manufacturer and other houses from whom they buy special commissions or salaries, which are quietly pocketed."

Our colonial friend has touched upon an important and delicate subject, as the manufacturer who has had experience in the export trade well knows; and while there is, of course, reason for his complaint, it should be remembered that prices are now cut very fine and keen competition exists in that trade as in every other. A commission-house in this country buying absolutely on the 2½ per cent. commission and giving up all special discounts would undoubtedly very soon find their business unprofitable; and the buyers abroad in the course of time will probably discover this and decline to pay any commissions whatever except in cases where it is absolutely necessary or to syndicate buyers, and some of the most enterprising houses have already embraced the new faith. Travelers in increasing numbers are now soliciting orders for manufacturers in the colonies, charging no commissions, as they receive their pay from the houses for whom they travel. This method has really done much for the American manufacturer, as it has at least given him information regarding the placing of his goods, who the consumers are, &c., which he has never

been able to obtain from the commission men who have been so carefully cultivated for many years through the medium of special discounts, advertisements, catalogues and salaries for travelers, &c. However, we are getting better acquainted

In the arrangement of the store, as far as possible, goods are designated by numbers, with the corresponding numbers in the shelves or other receptacles where the stock is kept. Illustrations of this will be found in some of the descriptions which

can tap a barrel and have it running without any assistance in ten minutes. The elevation is obtained by attaching the pulley in the space at cellar windows.

The Stoves represented upon the main floor are simply samples, as the main stock

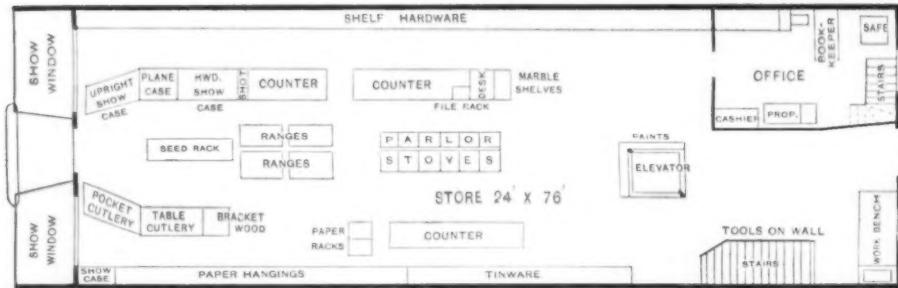


Fig. 394.—Store of W. D. Parlin, Natick, Mass.

with our foreign friends and soon more intimate relations will undoubtedly exist, and it is to be hoped that any existing distrust in regard to our business methods will be removed. Our commission merchants are enterprising and aggressive and have done a great deal for the extension of our foreign trade, and it is not to be doubted that they will be prompt in adapting their methods of business to the requirements of an enlightened policy.

Arrangement of Stores.

The accompanying illustration, Fig. 394, shows the arrangement of the store of W. D. Parlin, Natick, Mass., who has probably one of the largest retail Hardware stores in New England. Indeed, this diagram gives but an inadequate idea of the establishment, with its five floors, work-rooms, storehouses, &c. Besides showing the location of the shelving, counters, &c., the diagram indicates the arrangement of the office, which is at the opposite end of the store from the entrance.

One feature of the front door is referred to as very satisfactory, while it would from first impressions be condemned by many. It has plate-glass panels top and bottom, the effect being to give a very light, airy look to the front of the store, which is in fact nearly all glass. The first prediction, that it would keep one man all the time setting glass in the bottom panel, we are advised, has not been verified, inasmuch as in 12 years not a single panel has been broken.

The ceiling being almost 13 feet high gives room to hang a great amount of goods overhead without bringing them unpleasantly low, and it is found by actual count that 300 articles are thus suspended in full view and out of the way. There are eight strips 1 by 3 inches running the length of the store, excepting office, stairway, &c.

At intervals the entire length of the store sample boards or frames of black-walnut 10 x 42 inches are used. The center of these sample-boards is on one side of a bright color, covered with samples of goods, such as Nuts, Bolts, Locks, Knobs, &c. These frames are hung with strap-hinges, and upon the back price-lists are placed. This keeps the list out of sight, yet it can be seen very easily by swinging the frame half round. These sample-frames give an attractive, bright look to the store, and are useful to the customer in selecting goods.

The goods upon the shelves are kept for the most part in wooden boxes which are made to entirely fill the shelf, and of different sizes, to correspond with the goods which they contain. The advantages of this arrangement are mentioned as being that the boxes look well, are convenient for use and furnish something solid to attach samples to.

are given below. Stove-Linings, Grates, &c., are treated in this way, as are also Carriage-Bolts, Pipe Fittings, &c. Each shelf and parting is numbered, and the salesman to find an article has simply to look upon the list hanging near, which

is kept in the room above, which, by means of a cast-iron spiral staircase commencing on the floor in front of elevator, can easily be reached.

As indicated in Fig. 395, the office is two stories in height, the arrangement of

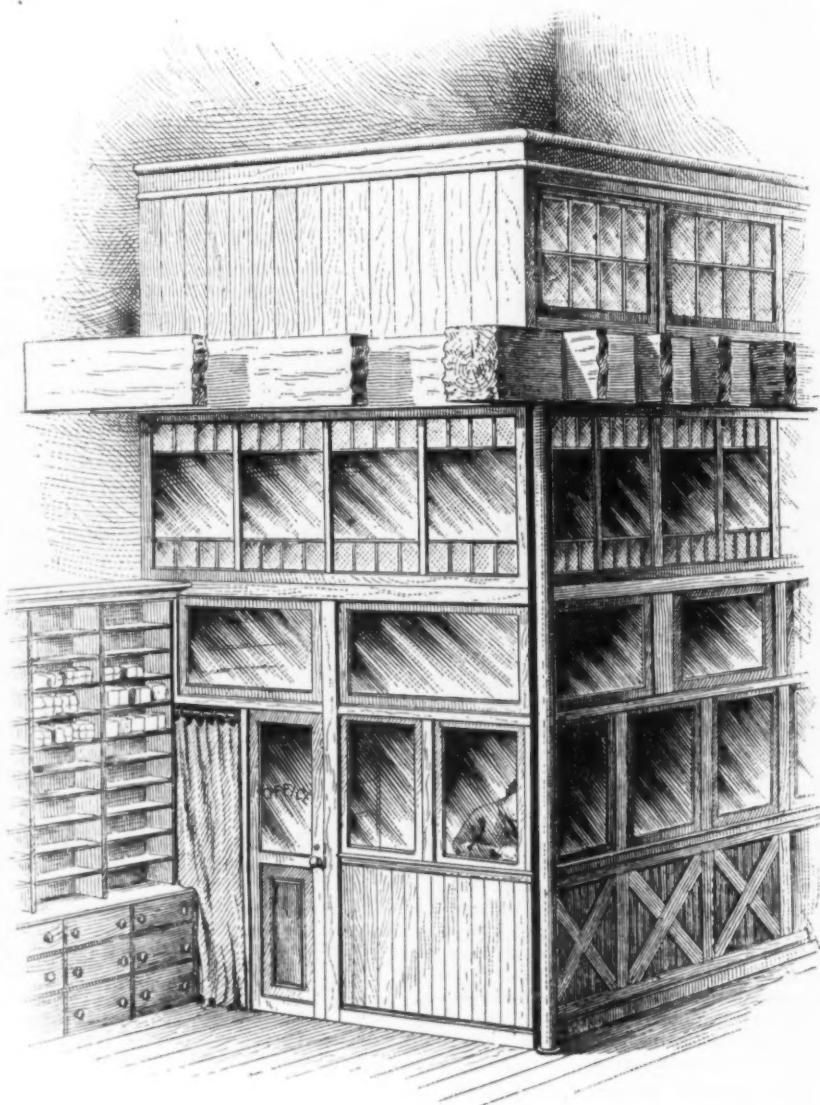


Fig. 395.—Two-Story Office.

gives the number of parting in which it can be found.

The oil-barrels in cellar are drawn up to a sufficient height by means of a differential pulley, and the oil, turpentine, varnish, &c., are emptied into stationary tanks. This is easily and quickly done, and we are advised that a boy 15 years old

the upper floor being shown in Fig. 396. Fig. 395 shows the flooring of the second story cut away, so as to indicate the manner in which the office is built, the upper office being partly above and partly below the second floor, occupying about 4 feet of the main salesroom and 4 feet of the second story, the floor of the upper office

being about on a level with the top of the shelving shown in the illustration. The lower office is occupied by the four book-keepers and the upper part is the private office, which, while securing considerable privacy, gives at the same time a view of all that is going on in the store. Speaking-tubes from this office connect with the various rooms and the cash-earns all come to the cashier's desk in it.

There is also in the office a telephone which is advertised to be free for use of customers. The office is well lighted with a large window by day and electric light by night. The upper office is reached from the lower by a half-circle stair-way. In the corner there is a dumb-waiter for convenience in taking up books, &c. It is run up by a 25-pound weight attached to a cord, which runs over a wheel in wareroom above the upper office. The dumb-waiter comes down to the top of safe in lower office. The plank floor to upper office is sheathed underneath and

as shown in the cut. This arrangement is referred to as inexpensive and serving a good purpose.

The entire length of the store above the shelving on the cornice is occupied by the names of very many articles which are kept in the warerooms and not always known to customers, such as Drain-Pipe, Barbed-Wire Fencing, Powder, Poultry-Netting, Hydraulic Cement, &c. The manner in which this is done is shown in Fig. 399. Good sizes of black letters are placed on sheet-zinc which is fitted in on

hung by a brass chain from the ceiling in salesroom, Fig. 403. The top and bottom of this construction are made of galvanized iron, connected by 12 brass rods. After the Chimneys are put on the rods the top is soldered on. No clerk has yet been known to sell the sample chimney under

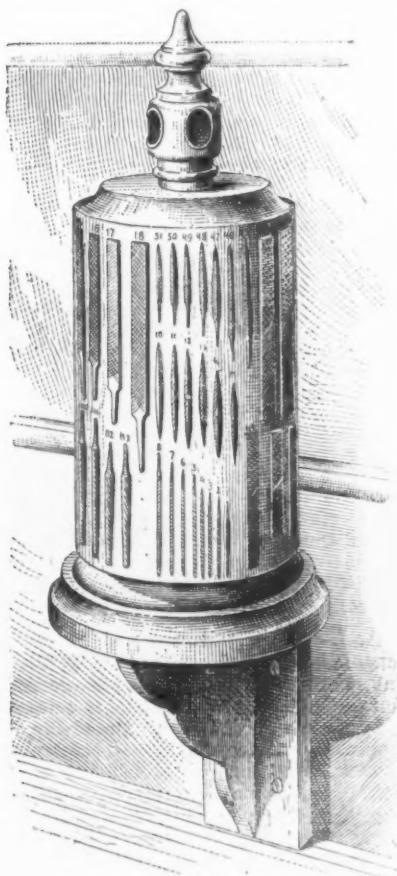


Fig. 397.—File Stand.

has birch-floor boards, so that it is firm and solid, though the entire thickness is not more than about 3½ inches.

The File-stand, Fig. 397, holds 50 Files of different sizes and styles. Over each there is a figure and in the shelves a space for each of the 50 kinds and a corresponding figure. The price and description of each File is upon a price-card hung near and also numbered. This is found to be a desirable arrangement, as customers are frequently unable to name the File they are looking for, and seeing it on a stand they can make their selection and the clerk take the corresponding File from the pigeon-hole, ascertaining the price from the list.

The arrangement for accommodating Shovels, Forks, &c., is shown in Fig. 398 and is somewhat similar in principle to one we have heretofore described, in which the Forks are suspended from notched iron brackets. In this rack rounds are driven into 2 x 3 pieces, and when necessary nails are driven in the top,

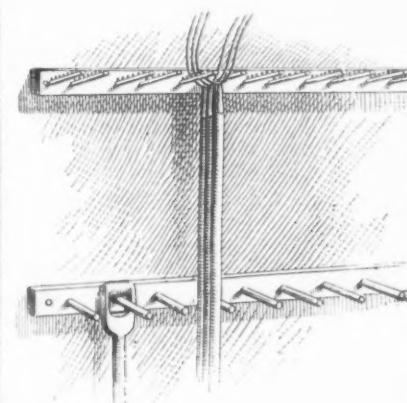


Fig. 398.—Steel Goods Rack.

the curve of cornice. It is an attractive arrangement and is referred to as paying well.

The Wire-Cloth stand shown in Fig. 400 holds 11 different sizes and it will be seen accommodates the goods conveniently and in comparatively small space.

The method of keeping Marble Shelves is shown in Fig. 401. A rack is made of 1½-inch pine slats, 3 feet long. It occupies a space in the store about 4 feet x 2½ feet, and will hold 66 shelves. This rack is 11 sections wide, giving room for 3 high and 11 wide, thus accommodating 33 shelves placed horizontally and the same number standing on end. This arrangement is referred to as keeping them in good order, as they do not touch each other and are in no danger of being scratched in putting in or taking out.

A home-made Revolver-stand is shown in Fig. 402, which indicates the manner in which the Revolvers are placed. It will readily be seen that a convenient and at-

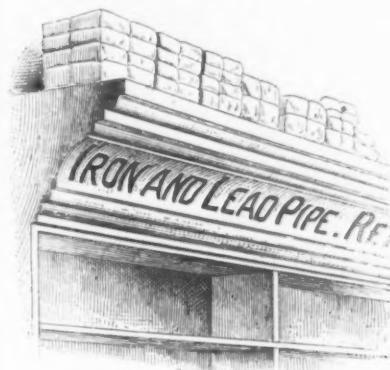


Fig. 399.—Lettering of Cornice.

tractive arrangement is thus secured. This stand is made by taking a horse-weight and putting a 3-foot wooden standard in the center of it and driving ½-inch brass pins in all sides, as indicated. If the base is bronzed and standard nicely painted it looks finely in show-window or other conspicuous place filled with Revolvers.

Lamp-Chimneys are kept in the cellar and samples of each are placed on a frame

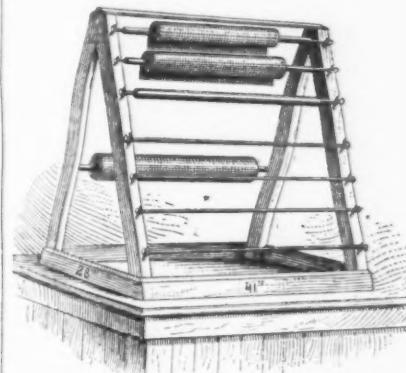


Fig. 400.—Wire-Cloth Rack.

this condition. Each chimney has its proper name lettered upon it and a number to correspond to the number on the package in the cellar, so that it is instantly found.

The extent of the variety of goods kept in this establishment is indicated in the fact that besides Hardware, Heavy Hardware, &c., the following lines among others are handled: Paints, Oils, Paper-Hangings, Stoves, Furnaces, Hot-Water Heaters, Tin-Ware, Sash, Doors, Glass, &c., Plumbing Materials, Soil-Pipe and Fittings, Iron Sinks, Agricultural Implements, Pumps, Cement, Plaster, Fertilizers, &c., so that Mr. Parlin is in a position to furnish nearly all material for

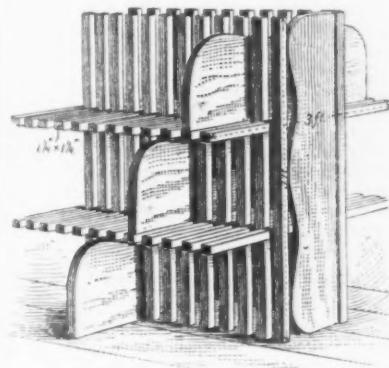


Fig. 401.—Rack for Marble Shelves.

building a house, except lumber and brick, and to put in plumbing and heating apparatus.

Trade Topics.

The following communication from a prominent Ohio Hardware house opens up a question which we take pleasure in submitting to our readers. It will be a matter of general interest, for some who have adopted such a cash system as is referred to will give the trade the benefit of their experience or suggestions in regard to the best methods:

We have been watching *The Iron Age* for some suggestions as to the best method of handling shop and contract trade in connection with a cash system. We thought some of your readers might have experimented with the cash business in the Hardware line, and would give the trade the benefit of their experience. We are of the opinion that it will be next to an impossibility to make it a success.

A correspondent in Illinois refers as follows to the matter of charges for drayage, which they think should be borne by the shippers of the goods:

We ask the copartnership of fellow-retailers in kicking against the charges of drayage. Do any of us retailers ever get drayage for delivering Stoves or Hardware ordered to be delivered? No. Yet every wholesaler will charge his country cousin drayage, but not their city customers. We are assured they will deliver

back and see what the discount was on goods the past year. After we get the net cost, if the goods are not delivered we add from 3 to 5 per cent. for delivery, owing to class of goods. The bulk of our heavy goods are delivered. On Nails and such heavy goods as are not delivered we know just what it costs for freight and drayage from depot to store, which is added at bottom of footing on the article—so many kegs at so much per keg. In this way we can keep track of the rate of freight from year to year. Our freight on Nails is only 6 cents and it ranges from that to 13 cents, owing to circumstances that no one but railroad men can explain, and which they will not do. Goods that are damaged or out of style we cut deep enough to assure us that we are on the safe side. If we come across any "chestnuts" we throw them in for good measure, and whatever we realize for them is clear gain on the inventory.

Items.

The trade will observe the advertisement on page 58 in which the Hartman Mfg. Company, Beaver Falls, Pa., call attention to their new Mat and their Fencing, illustrations of which are given. This company have opened offices at 92 Chambers street, New York, and 70 Beverly street, Boston, under their own direct management, which are to take the place of the agency heretofore held by Richard Thompson, 105 Chambers street. The advertisement also gives the address of their agencies in Chicago, Kansas City, Atlanta and San Francisco.

Kentucky Wagon Mfg. Company, manufacturers of Old Hickory Wagons, Louisville, Ky., are issuing a mammoth colored

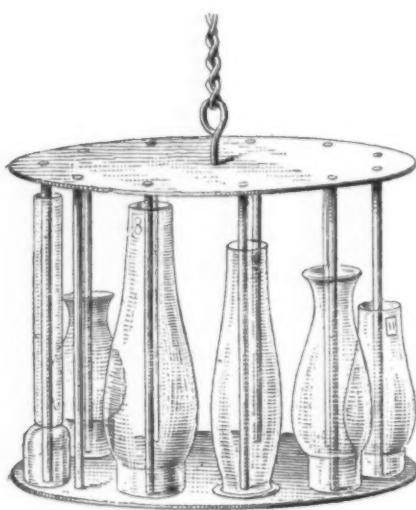


Fig. 403.—Sampling Lamp Chimneys.

goods free anywhere in the city; yet when they are asked to deliver to R. R. often much nearer drayage stares us in the face. If they cannot afford it let them go out of business and make place for others. Who pays the retailer's feed for his horses and wages for his men? Of course the purchasers, and we feel assured we retailers are doing the same. Is competition greater among wholesalers? No. We all know the jobbers are making the most out of it. Retailers are forced to adopt a uniform price. Where is the wholesaler that does the same? We have to meet him yet. Not long ago certain houses handling certain goods shipped f.o.b. This lasted for six months or more. They met, saw and conquered. The result was charge all so much per 100. We want the retailer on same footing with jobber, and as the former cannot get pay for delivering, we do not want the latter to get it either.

An Ohio Hardware man writes as follows on the question of stock-taking:

We are glad the question of inventory is being agitated in your enterprising journal and have no doubt that all who read the various modes of taking stock account will be benefited, for surely some new ideas that we may learn from the different articles will be useful. Our time for taking stock is the first of each year. We begin about the middle of December and shape all stock by filling up packages and weeding out superfluous boxes. This should not occur, but we cannot avoid it, as we sometimes get in a hurry and take the first box we come to without looking to see if there is not one already opened. We commence January 1 and go through with each class of goods separately. For instance, Locks must all appear on the inventory together, and so on all through where they can be classified. We simply put down the number, size and make of the article, except on small shelf-goods that don't count up much in value. On such articles, if they are of recent purchase, we take cost as marked (which has had 5 per cent. added for delivery). Now, after getting account of stock on our invoice-book we get the list of articles invoiced and extend and foot up at list prices. We then deduct the discount ruling January 1. We like this plan, as it is a satisfaction to look

A. H. Patch, Clarksville, Tenn., issues a 25-page pamphlet describing his Corn Sheller and Separator, in which a large number of testimonials are given in regard to it. Other circulars relate to his Black Hawk Corn Sheller and Separator and his Pop-Corn Sheller. The latter is simply a reduced size of the Black Hawk.

The Huebner Mfg. Company, Detroit, Mich., in their advertisement on page 99 call attention, it will be observed, to their Door and Window Screens and Window-Screen Brackets and Frames. More detailed information in regard to these goods is given in their circular.

The Turner & Seymour Mfg. Company, Torrington, Conn., issue a circular describing the Warren Self-Locking Washer Nut-Lock. Directions are also given for applying it.

Lefever Arms Company, Syracuse, N. Y., issue a catalogue describing their Hammerless Guns, in which a full explanation is given of the mechanism, with a number of testimonials from sportsmen. The company allude to the favor with which the Gun has been received and its rapidly increasing sale, requiring increased facilities for its manufacture. They have recently made some improvements in the Gun, simplifying its mechanism and fitting it for more effective service.

H. W. Hill & Co., Decatur, Ill., issue a striking advertising sheet in regard to their Hog-Rings and Ringers.

It will be observed that H. A. Williams Mfg. Company, 22 Milk street, Boston, Mass., in their advertisement on page 65 give illustrations of their line of Seamless Steel and Brass Oilers and Lamps.

Mr. H. T. Lockwood, who has been in business in New York for the past year, has returned to Chicago to act as the Western manager of Merchant & Co., the well-known Tin-Plate house of Philadelphia, New York, Chicago and London. Their Chicago branch is located at 202 Lake street, where they carry a large stock of Tin-Plate and other materials used by tinsers and roofers.

A. J. Jordan, Sheffield and St. Louis, manufacturer of AAA1 and Old Faithful brands of Cutlery, has recently put the finishing touches on his sales establishment at 417 North Broadway, St. Louis. Our correspondent was courteously shown through the establishment by Mr. Jordan's able and enterprising manager. The show-room occupies the entire first floor. Handsome glass cases are placed in pleasing order, in which are shown Razors, Scissors, Pocket and Table Knives, ladies' Work-Caskets and gents' Shaving Sets in endless variety. The second floor is used as a packing and sample room. Here are exhibited some of the choicest patterns in Case Carvers and ladies' and gents' Caskets. One of the most elegant is entirely covered with diamond-shape pearl. It has four drawers, folding-doors, covered with floral designs, and a secret drawer at the top. The contents include everything requisite for a lady's use in needle-work, the different articles being of the finest steel, and the handles, tips, &c., richly gilt. The silk and cotton reels are of pearl, exquisitely carved. There are innumerable patterns to choose from to suit the most fastidious, from \$5 to \$500. A decided novelty has just been received from the works in Sheffield and is now on exhibition in their show-window. It consists of a mammoth Razor, specially manufactured by Mr. Jordan for this purpose. The blade is 19 inches long and the weight 17 pounds. The steel used in its manufacture is the same as the ordinary AAA1 Razor is made from. This Razor does not derive its novelty so much from its size and weight, as many such have been manufactured heretofore,

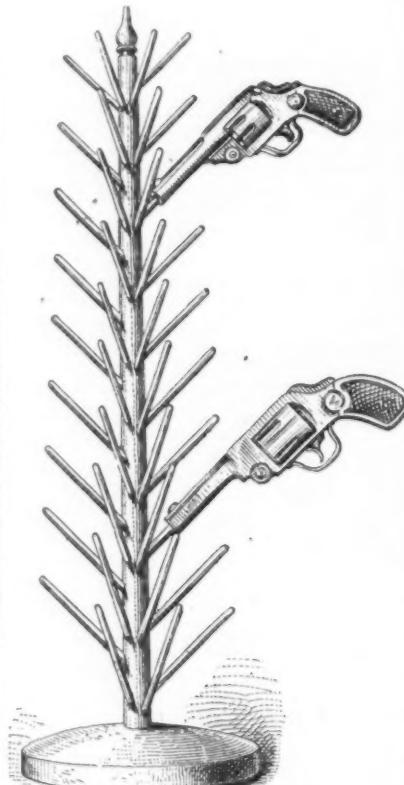


Fig. 402.—Revolver Stand.

lithograph, the subject of which is General Jackson at New Orleans, 1815. In this striking and handsome picture their Old Hickory Wagons appear prominently. This brilliant and effective poster is the work of Gies & Co., Buffalo, N. Y., and reflects credit upon their establishment. The qualities of the picture are such that, apart from the admirable way in which it serves its purpose as an advertisement, it will be valued by those who receive it for its pictorial effect.

but this one was forged, ground and finished to the same perfection as the goods daily turned out from their shops, and is justly entitled to more credit than it would perhaps otherwise receive. In addition to case goods, on this floor are shelves filled with Pocket-Knives, Manicure Sets, Bowies, Daggers, Stilettos, &c., also a full line of Razors, prominent among which is the Old Faithful, for which they are having a large demand. Jordan's Anti-Profanity Razor is also considered one of their leaders, on the blade of which appears a verse extolling the virtues of the aforesaid Razor. The third, fourth and fifth floors are used as storage-rooms. Mr. Jordan reports a large increase in his business during the past year, and with his increased facilities is in a position to meet the demands of a constantly increasing trade.

An error of judgment seems to be made every fall by those who sell seasonable merchandise in the Northern States. They will persist in believing that winter begins about October 1, and therefore spend two months in lamenting the "unusual mildness of the weather," if indeed they have no greater cause for lamentation by their inability to pay maturing bills, being overstocked with winter goods for which they find no demand. This year is no exception to the rule, and the coming of winter was postponed close to the beginning of December. A specially-designed almanac seems to be a "long-felt" want in that direction, although usually no better teacher can be found than experience, which has certainly given these deluded merchants some very hard raps.

In their advertisement on page 100 the Terry Mfg. Company, Horseheads, N. Y., illustrate their Anti-Friction Steel Leader Hanger, referring especially to its strength, ease of working and simplicity of construction.

D. B. McIlwaine, 97 Chambers street, New York, is representing the following Sheffield manufacturers: Ward & Payne, Sheep Shears and Tools; William Singleton & Co., Pocket Cutlery; Maleham & Yeomans, Table Cutlery.

Franklin Moore Company, Winsted, Conn., issue a sheet showing the line of Eagle Bolts and Norway Iron Carriage-Rivets of which they are manufacturers. Cuts are given of the different kinds of Bolts. The sheet is intended primarily for the carriage trade.

L. A. Sayre, Newark, N. J., has issued a catalogue and price-list No. 2, in which illustrations are given of the large and varied line of goods which he is putting on the market. It is accompanied by a discount-sheet giving prices on the different goods.

The trade will learn with special satisfaction that another book by William H. Maher, author of "A Man of Samples," "On the Road to Riches," &c., has been issued. It is entitled "Drum Taps; Leaves from the Diary of a Commercial Traveler." It is a readable and suggestive book, which will doubtless have a large sale, and is of especial interest to Hardware men. We shall have occasion to refer to it again.

The Beyer Mfg. Company, East Palestine, Ohio, are putting on the market the Kellogg Mowing-Machine Knife-Grinder, which is manufactured under patent July 9, 1889. The prominent feature of this machine is that the machine knife is ground while in motion. The grinder consists of a series of emery-blocks held over each section of the knife and beveled on the under side so as to fit exactly between the knife sections. These blocks are adjustable so as to correspond with the bevel of any knife. The work is described as

done rapidly and old irregularly-ground knives ground down gradually in less than five minutes by simply throwing the mower into gear and driving over the ground.

"The Iron Age" in Australia.

R. H. Dana & Co., 25 Beaver street, New York, a well-known and enterprising house representing manufacturers to the export trade, have established a branch house at Sydney, New South Wales, under the management of A. M. Grundy, who is widely and favorably known to the buyers in the Australian and New Zealand colonies. In addition to the manufacturers heretofore represented by them, arrangements have been consummated, as per the announcement on page 65, by which their Sydney house will represent *The Iron Age* in the colonies and receive orders for subscriptions and advertisements. Under this arrangement *The Iron Age* will be brought personally and systematically to the attention of the leading Hardware buyers with a view to still further increasing our already large subscription-list in those colonies. The connections already established by our agents and the enterprise and vigor with which they are pushing their colonial business give them an exceptionally favorable position in representing *The Iron Age* in their field, which is constantly assuming increased importance as a market for American Hardware.

Trade.

The following advices in regard to the Hardware trade of Louisville, Ky., will be of interest:

The Hardware trade is in better condition this week than last, although the sale of heavy goods may have fallen off a little. Shelf goods have gone out freely. Prices on the latter class remain remarkably low compared to raw materials. Bar and Sheet Iron are enjoying a good trade both from mill and store, remaining firm at last prices, although both Pig and Scrap are advancing materially. Since last report the Federal Steel Company having taken more definite shape, all \$3.60 prices on Barbed-Wire have been withdrawn and \$3.75 is now bottom from factory, with promise of further advance before January 1; \$3.75 to \$3.90 from store are current prices, the dealers not selling in unison. Wire Nails are firm at \$3.10 from factory and same from store. Cut Nails available at \$2.15 at Wheeling or \$2.25, delivered, Louisville; some factories refusing to quote for less than \$2.25, f.o.b. mill, are out of the market; \$2.35 to \$2.45 from store is selling price from dealers.

Exports.

PER BARK ILARA NOVEMBER 15, 1889, FOR PORT RATAL, SOUTH AFRICA.

By Arkell & Douglas.—16 dozen Picks, 14 dozen Traps and Ladders, 113 dozen Pins, 3 dozen Axes, 1 dozen Traps, 9 dozen Hammers, 6 dozen Axes, 10 cases Hardware, 7 dozen Hardware.

By Marcial & Co.—5300 pounds Nails, 10 dozen Axes, 10 dozen Hammers.

By R. W. Forbes & Son.—2 packages Oil-Stones.

By H. W. Peabody & Co.—21 packages Agricultural Implements, 4 packages Pumps, 3 cases Hardware, 41 cases Agricultural Implements.

PER BARK GEFION, NOVEMBER 16, 1889, FOR PORT ELIZABETH, SOUTH AFRICA.

By Goulds Mfg. Company.—3 Pumps.

By S. Ginteman & Co.—3 cases Lamps.

By E. Kuhe.—24 Plows.

By J. Norton & Sons.—5285 pounds Manila Rope.

By Coombs, Crosby & Eddy.—27,500 pounds Plows and Parts, 6½ dozen Wire Cages.

By Corner Bros. & Co.—6 Store-Trucks, 12 Step-Ladders, 12 Corn-Shellers, 4 Hand-Carts, 30 dozen Forks, 12 dozen Rakes.

By A. Field & Co.—32 Blocks, 12 Air-Rifles, 8 dozen Rakes, 10 dozen Tools, 40 dozen Handles, 1 dozen Sad-Irons, 8 dozen Tools, 30 gross Tools, 6 dozen Wash-Boards.

By W. H. Crossman & Bro.—41 dozen Picks, 10,800 pounds Sash-Weights, 250 pounds Sash-Cord, 50 Pumps, 2½ dozen Scales, 9 Meat-Cutters, 304 Plows, 10,000 pounds Barb-Wire, 6094 pounds Manila Rope, 5841 pounds Sisal Rope, 100 dozen Carpenters' Tools, 15 dozen Picks, 70,000 pounds Barb-Wire, 1 box Hardware, ½ dozen Stoves.

PER SHIP FRANK STAFFORD, NOVEMBER 20, 1889, FOR SYDNEY, N. S. W.

By Coombs, Crosby & Eddy.—5 cases Velocipedes, 66 dozen sets Sad-Irons and 3 dozen Handles, 12 dozen Braces, 75 gross Hardware, 1 gross Spoons, 3 gross Hatchets, 1½ gross Braces, 6 gross Hardware, 2 gross Hammers, 12 gross Handles, ¼ gross Levels, 2½ gross Saws, 10 gross Hardware, 9 gross Picks, 1 gross Hay-Forks, 1 gross Handles, 2 gross Picks, 100 Pairs Skates, 1½ dozen Axes, 2½ dozen Hatchets, 25 pairs Skates, 2 dozen Agricultural Implements, 75 pairs Skates, ¾ dozen Braces, ½ dozen Saws, ¼ dozen Money-Drawers.

By Mosbacher & Co.—19 gross Shears.

By McLean Bros. & Rigg.—8 cases Hardware, 10 dozen Zinc Oilers, 5 dozen Hay-Forks, 15 Washing-Machines, 1 dozen Sad-Irons, 1000 Handles, 1 dozen Hoes, ½ dozen Wringer, 40 dozen Handles, 5 dozen Braces, 6 dozen Meat-Choppers, 12 dozen Hatchets, 1 dozen Churns, 10 dozen Grindstone Fixtures, 17 cases Tacks, 6 dozen Hammers, 10 cases Agate-Ware, 26,000 Cartridges, 6 Guns, 21 Pumps, 44 cases Agricultural Implements, 1 gross Rat-Traps, 105,000 Bolts, 21 dozen Cow Bells, ½ dozen Wringer, 11 dozen wrenches, ½ dozen Corn-Shellers, 1 dozen Door-Bells, 1½ dozen Pumps, 3700 Bolts, 12 dozen Drills, 1-6 dozen Dies, 7 Springs, 3 Stoves, 12 dozen Wash-Boards, 8 dozen Locks, 45 dozen Saws, 138,000 Bolts, 2 Forges, 10 Washing-Machines, 5 Wagons, 2 Carriages, 120 dozen Handles, 18 dozen Whips, 6 dozen Lanterns, 40 dozen Axes, 6 dozen Hammers, 35 packages Agricultural Implements.

By R. W. Cameron & Co.—36 dozen Hardware, 10 dozen Handles, 4 cases Hardware, 17 dozen Saws, 2 dozen Lamp-Ware, 27 pounds Castings, 47 packages Carriage-Ware, 1560 pounds Bolts, 2 dozen Couplings, 2910 pounds Axes, 53 packages Carriage-ware, 95 pounds Castings, 214 pounds Hardware, 1 dozen Carriage-Ware, 8 cases Agricultural Implements, 1 barrel Iron-Pipe Fittings, 11 packages Machinery, 24 packages Agricultural Implements, 12 dozen Axes, 15 packages Machinery, 4 boxes Bolts, 37 cases Handles, 20 packages Plow Material, 11 packages Buggies and Parts, 6 cases Hardware, 61 cases Handles, 84 packages Agricultural Implements, 20 crates Money-Drawers, 30 packages Stoves and Parts, 1 case Police Calls and Batons, 3 cases Saddlery, 3 cases Shoe Nails, 1 case Brushes, 4 cases Saddlery, 88 packages Agricultural Implements, 1 box Machinery, 1 box Hardware, 58 packages Machinery.

By B. F. Avery & Sons.—110 Plows, 54 Plows.

By J. A. Gifford.—2 packages Handles, 3 packages Hardware, 1 case Saddlery.

By Peters & Calhoun Company.—1 case Saddlery.

By W. & B. Douglas.—36 Pumps.

By Sargent & Co.—26 cases Hardware.

By G. W. Harrison.—5 packages Pumps, 1 package Emery Wheels, 1 package Rubber Packing.

By Edward Miller & Co.—42 packages Lamp Goods.

By Welsh & Lea.—10 cases Iron Bolts.

By W. & B. Douglas.—12 Pumps.

By Collins & Co.—40 dozen Handled Axes.

By W. K. Freeman.—418 pounds Saws, 823 pounds Hardware, 19½ pounds Agricultural Goods, 36 dozen Pins, 40 dozen Handled Axes.

By Rogers, Smith & Co.—10 packages Plated-Ware.

By J. L. Mott Iron Works.—4393 pounds Stoves and Fixtures.

By W. & B. Douglas.—122 Pumps.

By Ilsey, Doubleday & Co.—12½ gross Axle-Grease, 150 dozen Handles, 6½ gross Axle-Grease, 1 gross Axle-Grease, 5 dozen Brushes, ½ dozen Wagon-Jacks, 12½ gross Axle-Grease, 3 boxes Hardware, 1½ dozen Braces, 1 case Fire-Arms, 16½ gross Hardware, 6 dozen Lamp-Goods.

By A. S. Lascelles & Co.—1 case Snaths, 22 cases Wagons, 25 dozen Axes, 3 dozen Hooks, 8 dozen Mattocks, 3 dozen Axes, 5½ dozen Meat-Choppers, 1 case Handles, 1 barrel Cow-Bells, 1 case Hardware, 4000 Cartridges, 12 dozen Files, 15 dozen Rakes, 4 dozen Grindstone Fixtures, 1 dozen Wringer, 8 dozen Mattocks, 8 dozen Wrenches, 3 dozen Tool-Sets, 1 box Pumps, 1 gross Hooks, 1 case Pencils.

By Collins & Co.—74 dozen Tools.

By Oil Well Supply Company.—33,000 pounds Iron Pipe.

By C. B. Rogers & Co.—380 pounds Wood-Working Machinery.

By Edward Miller & Co.—64 packages Lamp Goods.

By Healy & Earl.—2 boxes Emery-Wheels, 3 boxes Emery Machinery, 3 cases Forges, 2 cases Wood-Working Machinery, 9 packages Saws.

By Morris, Strouse & Co.—120 dozen Axe-Handles.

By Coombs, Crosby & Eddy.—6 dozen Hoes and Rakes, 50 dozen Tools, 12 dozen Braces, 24 Lawn-Mowers, 51 dozen Hardware, 20 dozen Tools.

By Arnold Cheney & Co.—1 crate Wheels, 10 cases Ranges, 10,486 pounds Axles, 845 pounds Axles, 7000 pounds Wheels, 17 cases Oil Stoves.

By R. W. Forbes & Son.—3 packages Wagons, 3 packages Agricultural Implements, 5 packages Cultivators, 4 Corn-Mills, 4 packages Hay-Presses, 7 packages Agricultural Implements.

By H. W. Peabody & Co.—12 cases Pumps.

By W. E. Peck.—5 packages Plated-Ware, 5 cases Hardware, 5 crates Saddlery, 4 cases Hardware, 2 cases Agricultural Implements.

By Arkell & Douglas.—3 cases Hardware, 8 cases Meat-Choppers, 7 cases Lamp-Ware, 28 cases Trucks, 15 cases Handles, 16 cases Hardware, 5 boxes Picks, 1 case Sand-Paper, 9 cases Carriage-Ware, 1 case Handles, 4 cases Axle-Grease, 1 crate Wringers, 4 packages Lamp-Ware, 3 cases Perambulators, 1 case Reflectors, 59 cases Bolts, 64 cases Axle-Grease, 40 barrels Lamp-Ware, 3 barrels Pumps, 22 crates Stoves, 6 cases Sad-Irons, 22 cases Handles, 59 boxes Axes, 2 cases Hammers.

By V. Basanta.—28 dozen Hammers, 10 dozen Spades, 110 dozen Handles, 30 Saws, 6 dozen Braces, 6738 pounds Galvanized Fence-Wire, 500 pounds Nails and Staples, 26 dozen Wash-Boards, 24 Churns, 33 Stoves and Fixtures, 18 Wringers, 1 case Saws, 12 dozen Lemon-Squeezers, 5 Velocipedes, 40 boxes Tacks, 8 Scales, 94 dozen Hardware, 35 packages Lamp Goods, 4 barrels Lamp-Ware, 12 dozen Cow-Bells, 1000 Wheels, 12 Velocipedes, 500 Axles, 5 Velocipedes, 15 dozen Cow-Bells, 12 dozen Shears.

By F. B. Wheeler & Co.—4 dozen Cork-Pullers, 25 dozen Axes, 1 box Saddlery, 3 cases Hardware, 1 case Hardware, 24 dozen sets Irons, 8 dozen Wringers, 10 cases Hardware, 30 sets Axes, 12 cases Hardware.

By Strong & Trowbridge.—2 packages Emery-Wheels, 70 dozen Handles, 1 case Lamp-Ware, 1 case Washers, 1 case Hardware, 1 case Stills, 1 case Chucks, 2 cases Wringers, 1 case Rubber Packing, 58 cases Handles, 1 case Hardware, 2 cases Handles, 12 crates Stoves, 2 barrels Stove-Fittings, 121 packages Pumps, 10 packages Hardware, 3 cases Axes, 2 cases Lamp-Ware, 2 cases Emery-Wheels, 4 cases Carriage-Bolts, 5 cases Nails, 3 crates Boring-Machines, 6 barrels Lamp-Ware, 3 packages Plate-Dies, 25 packages Lamp-Ware, 1 case Hardware, 4 cases Lanterns, 1 case Primers, 1 package Razor-Straps, 1 Tool-Chest, 1 case Scops, 4 barrels Emery-Wheels, 1 case Cartridges.

By B. F. Avery & Son.—35 Plows.

By W. H. Crossman & Bro.—4 bundles Carriage-Ware, 10 dozen Handles, 1 dozen Wringers, 76 dozen Handles, 12 dozen Mop-Handles, 3½ dozen Oilers, 16½ dozen Wrenches, 40 dozen Axes, 1 dozen Wringers, 5 tons Wire, 16 dozen Hatchets, 1½ dozen Corn-Mills, 400 pounds Nails, 6 dozen Mattocks, 8 cases Cages, 10 dozen Traps, 156 dozen Handles, 12 dozen Oilers, 30 sets Stove Parts, 5 cases Hardware, 129 packages Carriage-Ware, 4 crates Carriage Ware, 20 dozen Axes, 12 dozen Hatchets, 90 dozen Handles, 1 dozen Wringers, 12 dozen Hammers, ½ dozen Bolt-Clippers, 2 Tire-Upsetters, 1 dozen Wringers, 20 dozen Handles, 2 Drill-Machines, 12 dozen Anti-Rattlers, 1 box Axes, 22 packages Hardware, 6 dozen Handles, 20 dozen Hatchets, 10 dozen Axes, 16 dozen Hatchets, 20 dozen Axes, ½ dozen Wringers, 1 dozen Churns, 20 dozen Hatchets, 6 dozen Wrenches, 1000 Handles, 3 dozen Axes, 12 dozen Handles, 1 bundle Tin-Ware, 13 bundles Hardware, 22 dozen Wrenches, 4½ dozen Cages, 6 dozen Wringers, 3 dozen Carpet-Sweepers, 1 case Hardware, 6 packages Plated Ware, 10 cases Hardware, 3 dozen Churns, 60 dozen Handles, 3 dozen Axes, 1 dozen Sifters, 72 dozen Handles, 62 dozen Whips.

A coal palace to be erected in St. Louis will, it is predicted, put the St. Paul ice palace in the shade. It will be 150 x 300 feet and three stories high. The coal companies will furnish the material for the superstructure—black coal of every kind, and wrought out by saw, by mason's hammer, and into artistic forms by the carver's chisel. The first floor will be of polished coal and pillars of coal will support the floor—coal, coal everywhere. The Mayor of East St. Louis will be one of the committee of award. The purpose of the building will be to continually exhibit the agricultural and mineral products of Southern Illinois.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Paints and Colors.

Business has been somewhat better the past week than during the preceding fortnight, more favorable weather having admitted of work being pushed forward that was previously delayed by the rain, and thereby caused a rather larger demand for several lines of Paints. Apart from this, however, there has been no change. Contracts for grinders' Colors continue to be made in a very conservative way and the purchases of the various pigments and Colors in proper form for retail distribution and consumption appear to be confined to immediate necessities. Values are showing no important fluctuation in any line of goods, and the market, as a whole, preserves fairly good tone despite the rather disappointing volume of business during the past month.

White Lead.—Distribution has been of somewhat larger volume, yet merely fair all told and not above the average for the season. Buyers generally confine their orders to such quantities as imperative wants require, the impression being general that should the trust make any change in prices or rebates the net result will be cheaper rather than dearer Lead. For the present the old figures prevail and are adhered to by outside corrodors, as well as by those in the trust.

Zincs.—American Oxide is without important change in any particular. Sales have been slightly more numerous than during the preceding week, but the quantities involved in individual orders were invariably small and previous prices rule on the several grades. Foreign Zincs remain very steady at previous prices and meet with about the usual sale in jobbing quantities.

Colors, &c.—House-painters' Colors have met with very fair sale in a jobbing way, and while still slightly variable in some few instances prices have undergone no quotable change. Grinders' Colors fairly hold their own in price, but are moving in a moderate way only.

Ready-Mixed Paints.—Have had rather freer sale, but the volume of business in this line is hardly up to the average for the season.

Miscellaneous.—Whiting has continued to meet with very fair sale at steady prices, and the movement of Paris White keeps up well also. Barytes continue scarce and very firm.

Animal and Vegetable Oils.

The general situation appears to be much the same at this time as it was a week ago. There is no particular change in the character of the business passing or in the demand, and the conditions bearing upon values contrast in no remarkable degree. The late advance on Sperm and Whale products is firmly maintained, and holders talk confidently of still higher figures being reached in the near future. Linseed-Oil is held with as much if not even greater firmness, owing to the continued high cost of seed. Lard-Oil is a trifle easier. On the balance of the list values appear to keep quite steady, and the volume of business in most lines is reasonably good.

Linseed-Oil.—City manufacturers hold very firmly for full previous prices in the absence of cheaper raw material, and the little outside stock that comes this way is

taken up with little ceremony. Present high prices prompt the use of substitutes to the fullest possible extent, but the amount of Oil selling is, nevertheless, close to the full average for the season.

Lard-Oil.—The market for this lubricant has weakened a trifle under the weight of increased offerings and some falling off in the demand. Best city brands are now offered at 54¢ in ordinary quantities, and 53¢ would doubtless be accepted for round lots. Outside brands are offered at 53¢ in ordinary jobbing quantities.

Cotton-Seed-Oils.—Operations in Cotton-Seed products have been on a rather more liberal scale, and the market seems to be toning up a little, though as yet not lively enough to bring about any decided change in prices. About 2000 barrels crude have been sold at 28¢ for prime, one-half of the amount going for export, and about 500 barrels Summer Yellow went at 35¢. Those prices appear to be strictly inside for prime stock.

Sperm-Oil.—Transactions in the crude article have been on a smaller scale, 600 barrels covering the entire business reported for the week. The market remains very firm, however, with full former prices ruling on both crude and manufactured products.

Whale-Oils.—There has not been the slightest change in the market for these products. Crude Oil is held at an extremely high price and the manufactured products are firmly held, though quiet.

Menhaden-Oils.—The crude Oils remain in good shape and are firmly held, but have had no important movement the past week. In the pressed and bleached Oils there is very steady trade at unchanged prices.

Olive-Oils.—Italian Oil in barrels remains very firm, bringing 73¢ from first hands and up to 75¢ in some instances. The demand runs very fairly.

Cocoanut-Oils.—The movement in this line has been of ordinary character and fair all told. Prices have not varied materially.

Proportions of Steam-Cylinders.—The well-known engine-builders of England, John Musgrave & Sons, follow the ratios given in the following table in proportioning the cylinders of compound and triple-expansion engines:

Compound.	Triple expansion.		
	Pressure of steam in lbs. per inch.	Ratio of L.-P. cyl. to H.-P. cyl.	Pressure of steam in lbs. per inch.
60	2½ to 1	100	1 to 2
70	2½ to 1	120	1 to 2½
80	3 to 1	140	1 to 2½
90	3½ to 1	160	1 to 2½
100	3½ to 1	180	1 to 2½
120	4 to 1	.....	1 to 3

The Erie Basin Dry Docks, leased and operated by Handson & Robbins in connection with the Albany Street Iron Works, in this city, have been converted into one of the best-equipped iron ship-building plants in the country. The heaviest shafting and pieces of machinery are readily swung into position by means of steam-crane.

The first statue erected in this country to a workingman will soon be unveiled in Sacramento. It is in honor of E. J. Stevens, late master mechanic of the Southern Pacific, who had for years been in charge of immovable railroad shops in Sacramento. The funds for the monument were contributed entirely by workingmen.

The Perfection Sad-Iron.

The above is the caption under which the Perfection Sad-Iron Company, Southeast corner Fifth and Sycamore streets, Cincinnati, Ohio, are placing upon the market a new form of self-heating sad-iron, and of which the accompanying illus-

is again pushed into its place, locking the body securely. It is made in different weights and shapes adapted to all purposes where irons are used. The manufacturers state that it is durable in construction, will not leak, can be lighted as easily as a lamp and is almost immediately ready for use, at an expense of not to ex-

ton, but in Pennsylvania the mine operators are only interested in collecting the freight charges and fostering a new industry. The new fuel is made by a syndicate who control the patent.



Fig. 1.—The Perfection Sad-Iron.

trations, Figs. 1 and 2, give a perspective and sectional view. The fuel used for heating is alcohol, poured into the handle reservoir at C, the fluid being conducted downward through the column at the rear of the iron, thence to the burner, which is attached to its lower end, as shown in Fig. 2, the valve D regulating the flow of alcohol to the latter. The burner consists of a cast cylindrical tube, having upon its under side a recessed cavity its full length. In this cavity is placed a piece of No. 24 wire to prevent the asbestos packing, which is forced in at C to serve

ceed from 1 to 2 cents per hour, one filling lasting from three to four hours. It is said to be entirely free from danger of any kind, is nicely finished in nickel-plate and enamel and heats sufficiently for the heaviest work and requires no holder for the handle.

Pressed culm fuel, made from anthracite dust at the immense heaps of refuse everywhere seen in the mining regions in Pennsylvania, is being manufactured by machinery with great success by a company recently organized. The fuel is turned out in 15-pound bricks, sell-

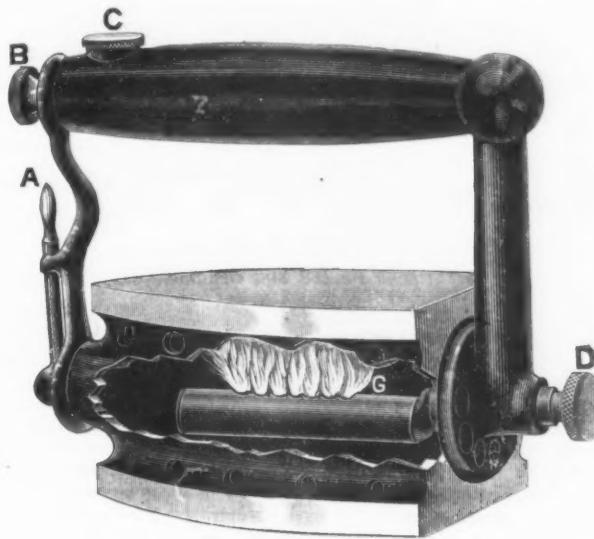


Fig. 2.—Perfection Sad-Iron, Showing Burner.

as a wick, from filling up the recess mentioned and thus obstructing the free flow of the alcohol throughout the entire length of the burner. It will be noticed that the iron is double-faced, providing one face in constant readiness for use when in operation. Vent-holes immediately below the polished edges as well as at the rear afford proper combustion. To reverse the iron an outward pressure of the lever A releases the latter from the lugs, and by means of which the body is reversed, when the lever

ing for 6 cents each. The works are at Mahony City, Pa., and the fuel in process of combustion may be seen at the office of the Reading company in New York. It makes a steady, hot fire, well adapted to domestic use. What is known as the Eagle brand has a slight admixture of pitch, sufficient to make the particles adhere, in which form it burns the same as pure anthracite. Utilizing culm at once gives value to enormous accumulations of waste hitherto only an incumbrance. In Europe the stuff costs \$2 per

The Common-Sense Pole-Cap.

J. A. & D. P. Cooper, Struthers, Ohio, are offering to the trade under the above title a device for wagons, mowing-machines, &c., which is intended to prevent the catching of the reins under the tongue, or dropping of the tongue if the traces become detached. A reference to the engravings will show that the cap or tongue socket is made in two sections, in order to permit of the eyelet being inserted before

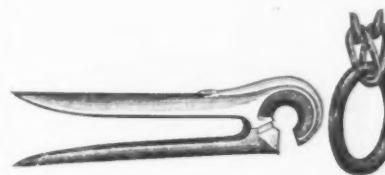


Fig. 1.—The Common-Sense Pole-Cap.—Open to Receive Ring.

the parts are securely riveted together, the parts when secured together forming an eye at the outer end, open at the bottom, with a loose eyelet on the inner side, open at the top. In hitching up the eyelet is thrown around to the top of the eye, which brings both openings together, as in Fig. 1. The neck-yoke ring is then inserted and the eyelet dropped to its natural position, as in Fig. 2, where it not only rests against a stop by its own weight, but is



Fig. 2.—Closed on Ring.

kept in place by the neck-yoke ring which latter is thus locked in the eye, and cannot escape under any circumstance until the eyelet is again lifted over it. The manufacturers state that the device, while light, is strongly and well made of the best annealed malleable iron, that it cannot become broken or get out of order, and that it can be applied by any one. They also refer to the satisfactory reception which it has met with from the trade.

The Employers' Liability act, passed by the Massachusetts Legislature of 1888, received a blow on Friday by the decision of the Supreme Court in the important test case of *Lucy Ryalls vs. The Mechanics' Mills of Fall River*. The action was based on injuries received by the plaintiff on account of alleged defective machinery in the mills, and the verdict of the jury was in her favor in the sum of \$718.50. The opinion of the Supreme Court, which was written by Judge Holmes, is an elaborate review of the common law rights inherited from the English law, and while sustaining the verdict on the ground that the plaintiff was entitled to the same under a common law remedy, the court practically decides that the statute known as the Employers' Liability act is nugatory and that it is a cumulative remedy.

The Maine Ice-Creeper.

The illustrations herewith given represent the Maine ice-creeper, which is manufactured and put on the market by Gay & Parsons, Augusta, Maine. The construction of the creeper will be readily apprehended by an inspection of these, Fig. 1 presenting a general view of the article and Figs. 2 and 3 indicating its applica-

*Fig. 1.—The Maine Ice-Creeper.*

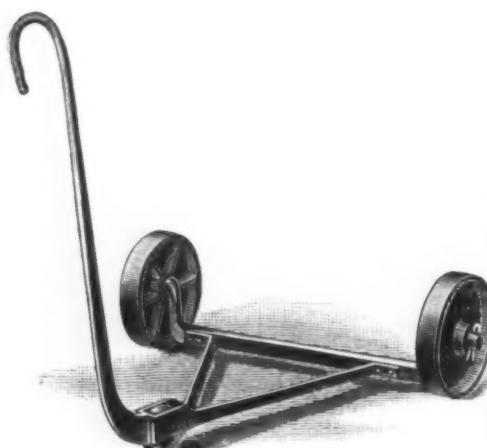
tion. The manufacturers make the point that being securely fastened in the hollow of the foot the creepers hold equally well whether going up hill or down, which is referred to as not the case with those fastened on the heel or ball of the foot.

*Fig. 2.—Applied to Shoe.*

The creepers can be worn on overshoes, rubbers or rubber boots as well as on ordinary boots and shoes.

The Bristol Truck.

The National Barrow and Truck Company, 82 and 84 Fulton street, New York, are manufacturing the Bristol Truck, which, as represented in the accompanying illustration, is obviously possessed of new features. It is especially intended for handling heavy barrels, boxes and machinery or other articles which must be

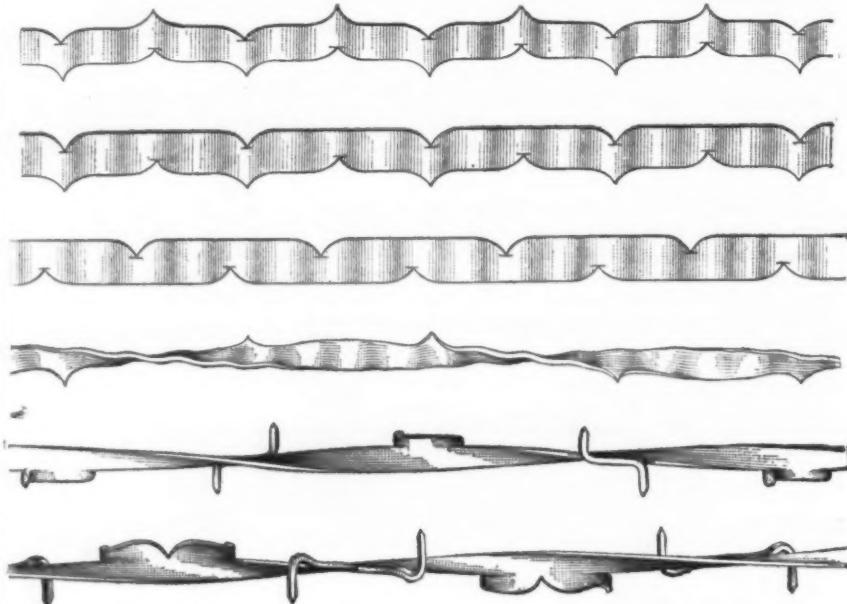
*The Bristol Truck.*

carried in an upright position. The axle is iron and runs very close to the floor, making it easy to put heavy articles on it. It is also pointed out that a platform or box can be built on these trucks at a slight expense, making a very strong platform

truck or box-car. This truck is made in three sizes—Nos. 1, 2 and 3—with a capacity respectively of 750, 1000 and 1500 pounds.

Solid Steel Barbed and Ornamental Fencing.

T. V. Allis, 12 East Thirty-first street, New York, who invented and established the Buckthorn Fencing, has lately developed new methods and varieties which possess features of considerable interest to the trade and farming community. It has been his chief aim not only to produce an attractive and efficient article, but to lower the cost of manufacture, and to this end he does away entirely with the process of wire-drawing and acid cleaning. Instead of starting with a wire-rod, which has to be drawn into No. 12 $\frac{1}{2}$ wire for the manufacture of the ordinary barbed fencing, Mr. Allis takes what is practically a long barrel-hoop, which is cut without waste or scrap into barbed and ornamental fencing, some of the patterns being illustrated in the accompanying engravings, which are reduced in size from the original specimens. These illustrations show, it will be observed, six patterns, three of which are corrugated and three twisted, two of the latter having barbs, which are formed by cutting the strip longitudinally and turning the points

*Allis' Solid Steel Barbed and Ornamental Fencing.*

as indicated. We have been shown some 20 different styles of this solid steel fencing, in description of which a catalogue has been issued which contains tables of comparative tests of strength and weights of a variety of barbed fencing made by several of the most prominent manufacturers in the country. The contents of Mr. Allis' catalogue show that he has gone deeply into the subject. Much of the information is entirely new to us, and we have no doubt is also to many who have been interested in barbed wire since its inception. A prominent feature claimed for this solid steel barbed fencing is its light weight and high tensile strength. Twenty-one specimens as tested by Fairbanks & Co. averaged 1530 pounds tensile strength, while the average weight was but 1 pound 8 ounces per rod (16 $\frac{1}{2}$ feet). The lightest specimens we illustrate weigh 14 $\frac{1}{2}$ ounces per rod and the heaviest 1 pound 3 $\frac{1}{2}$ ounces. The material used for these tested specimens was English barrel-hoop steel imported for the Standard Oil Company.

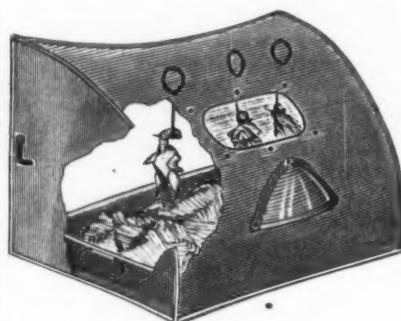
clearly indicates the general construction of the device that further descriptive particulars are unnecessary.

The Montreal Council having authorized the expenditure of \$1,000,000 for harbor improvements, the municipal electors will soon be called on to satisfy the measure. The Ottawa Government is expected to contribute an equal amount.

Recently 75 elevators on the lines of the Northwestern Railroad were sold by one firm to the Chicago and Northwest Granaries Company. Within a few days a firm in Chicago have closed a contract for the sale of eight of the largest grain-elevators in that city to a similar company, also organized in London, where it was asserted that 30 per cent. profits had been realized in 1888 and that they could be increased by raising rates. Chicago papers intimate that Western farmers, if they would escape from the trap set for them, must keep their unsold elevators within their own control.

Improved Cooker.

In the accompanying illustration we show a new apparatus for cooking which is being placed on the market by Mr. Joseph Forshaw, of St. Louis, Mo. The

*Improved Cooker.*

cut shows the device with one end partially broken away, clearly indicating the interior construction. It is made of sheet-iron and so arranged that it may be used either on an open Franklin or an ordinary cook stove. The front is provided with a window, through which the contents of the cooker may be inspected. The cut so

Cooking and Heating Stoves Abroad.

BY WILLIAM J. KEEF.

(Continued from Page 804, November 28.)

THE HEATING STOVES OF FRANCE.

We find here almost the same stoves as in England, only the climate is still warmer and therefore less heat is needed. For the last six years a stove that was introduced by a Russian has had a very extensive sale. It is the same slow-combustion stove that we saw in England, but made lighter and of wrought-iron. This stove has two wheels at the back corners of its base so that it rests on these



Cooking and Heating Stoves Abroad.—Fig. 27.—French Stove on Wheels.

wheels and on the front corners. When it is desired to heat a room this stove is wheeled into it and the pipe inserted into a hole in the plate that closes the fireplace. When this room is hot enough the stove with its burning fuel is wheeled into another room. In this way one stove may take the chill off from all of the rooms on a floor. These stoves have been so popular in France that hardly any other kind could be sold.

The French people do not seem to realize that the gas will pour out of such a stove during the time that it is being changed from room to room, or that the running of a hot stove-pipe into a cold

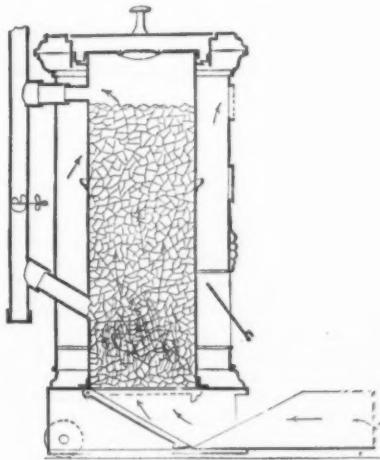


Fig. 28.—Section of French Slow-Combustion Stove.

chimney may cause the draft to be such as to force the gas from the coal into the room. So many deaths and accidents have occurred from this cause that the Board of Health have declared against these stoves, and dealers are anticipating that they can hardly dispose of the stock they have on hand the present year. The lack of information in regard to the danger from breathing gas from anthracite coal or coke is shown by the accompanying cut

(Fig. 27), which is an exact reproduction of an illustration from the outside of the cover of a stove catalogue which was given us at the Paris Exposition. It shows a slow-combustion stove wheeled into the center of a room without any connection with a chimney. The smoke-pipe is seen half-way down the stove body with the damper shut square off. This means that the French stove-dealer advises this use of his stove.

The French use one device for heating the air of a room that we would do well to copy. They interpose one or more extra sheet iron cylinders between the hot stove and the outer casing (Fig. 28). The heat from the stove heats each of the cylinders, and the air from the floor in passing between them finds twice the surface that would otherwise be presented. No more heat is developed by these jackets, but the air of the room is heated faster. In French stoves the external cylinder is generally of Russia iron perforated with ornamental openings.

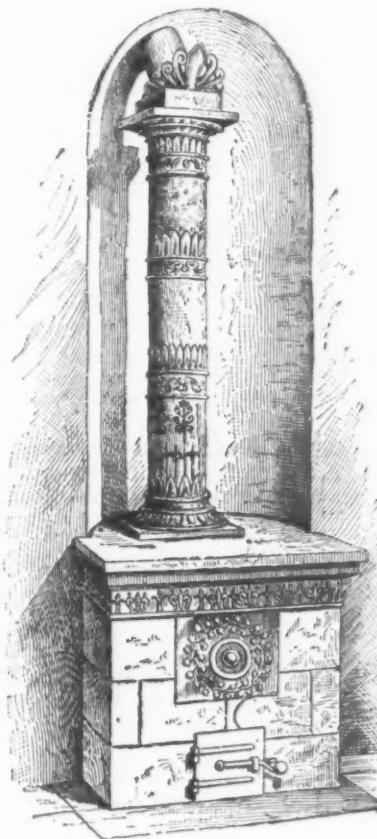


Fig. 29.—Stove of Glazed Brick with Terra-Cotta Pipe in Room of Hotel in Paris.

Some are coated with white enamel and others have beautiful designs burned into these porcelain coatings. As little cast-iron as it is possible to use is employed in the construction of these stoves. Occasionally we find nickel used to embellish the surface of one of them and far less mica is used than in America.

In France we begin to meet with stoves of tiles or enameled bricks built into the rooms. In the room behind the one which we occupied at our hotel at Paris was a stove (Fig. 29) built into a recess in the wall of glazed bricks and with terra-cotta pipe.

As we reached Belgium, where the climate is slightly colder, we find larger and more substantial stoves used and more of the tile and brick-work stoves. At Brussels the Michigan Stove Company have a depot from which they supply most of their European trade. This firm have a large display of their stoves at the Paris Exposition, among them several Art Garlands.

In Germany the heating stove becomes as important an affair as in the United

States. Stoves made of cast-iron or of iron enameled to imitate tile, or wholly of tile, or of enameled bricks, are found in every store.

THE GERMAN IDEA OF HEATING

is to heat up a large mass of material by a fire burning a short time, and then use the slow radiation from this mass to heat

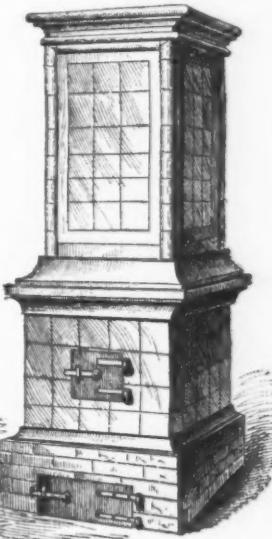


Fig. 30.—Tall German Sill Stove.

the room. Such stoves are often built in the corner of a room as a permanent fixture often forming a mantel and extending to the ceiling. The door to such a stove would often be from the other side of the wall, the feeding being from a hall by an attendant who would build a small fire early in the morning to heat the bricks, which by a slow cooling would keep the room comfortable all day. At the exposition there was quite a large display of tile stoves from Nuremberg. One was in the form of a round column perfectly white and extending from floor to ceiling.

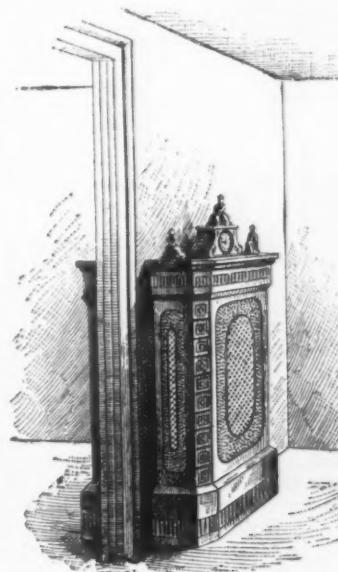


Fig. 31.—Stove in Front and Back Parlor of House of American Consul Potter at Crefeld.

Others were square and white enameled, while others were of tile, very massive and tall (Fig. 30). These stoves have very small fire-boxes, intended, as a general thing, for wood or anthracite coal. German iron stoves are built to imitate these tile stoves as much as possible. The doors

and latches and fittings show that the maker has little ambition to make money, as each piece is the work of a locksmith, and a large amount of needless work has been put upon such a stove, with the resulting parts weak and not suited to the rough wear which every stove gets. Probably they know that their stoves are to be used carefully, but American adaptation of a thing to the position it is to occupy is much better in stove construction than what we saw at this exhibit.

The idea appears on the surface of every stove that the maker has endeavored to produce what to him seems a thing of beauty, and has tried to make the stove an ornament, giving but little thought to the internal construction.

WHERE REAL HEATING IS NEEDED WE WOULD EXPECT TO SEE THE AMERICAN STOVE.

In the dining-room at our hotel at Crewefeldt was a beautiful German stove which seemed to be a plate-warmer, but near the entrance was a Garland base-burner. This was of a rather old pattern and looked inartistic when compared with its more



Fig. 32.—Belgian Stove with Cast-Iron Pipe

beautiful companion. But the landlord said that he depended upon it to do the work during cold weather.

In all of the countries that we visited we saw another adaptation of the slow-combustion stove (Fig. 31) which we first described. The ornamental casing was made in two halves and was set in the two sides of a wall in which a chimney had been constructed so that it could not be seen on either side. Each room to be heated contained one of the halves of the casing set so as to look like a handsome piece of furniture. Inside of this and directly under the chimney-flue was a stove which would throw its heat through the fret-work into each room. The casing was very ornamental, was black japanned, with very little gilding and in such accord with the general decoration of the room that it was some time before we discovered that this was the stove.

The corners were cut away and a vertical rows of tile inserted. A finely carved open-work base and cornice surmounted by a colored marble top made its shape symmetrical. On the top rested a fine clock and several pieces of *bric-à-brac*. The casing in the back room was not as expen-

sive and its whole front was made to swing open to give access to the stove. The galleries of paintings at the Louvre in Paris have a similar arrangement. What appeared to be massive mantels are on each side of a division wall. The stoves inside take four-foot wood. Hundreds of cords of this wood are piled in the court for use during the coming winter.

A very neat example of this effort to conceal the stove came to our notice in Brussels. While we were out for a drive we were overtaken by a violent storm, and leaving the carriage we ran into the nearest open door, which chanced to be that of a large beer hall. In the center of the hall was what appeared to be a round steam-radiator (Fig. 32) covered with carved fret-work, surmounted with black marble and set around the base of an iron column. After being some time in the room we chanced to notice a knob which proved to be the fastening of a door which disclosed a cylindrical coal stove within the casing. What had appeared to be a black iron column was a cast-iron stove-pipe, with ornamental bands and a fine capital. This pipe either entered a flue in the floor of the room above or passed through that room to a chimney. The effort to conceal the stove is often so successful that they would have escaped our notice if we had not been on the lookout for such peculiar articles of furniture.

PERSONAL.

John Sutcliffe has resigned his position as general manager of the Londonderry Iron Company, Limited, of Londonderry, N. S. He will open an office as consulting-engineer and contractor at Poughkeepsie, N. Y.

Thomas G. Boyle, of the brokerage firm of T. G. Boyle & Co., Pittsburgh, Pa., has returned recently from a European trip.

Hon. Benjamin Butterworth, Hon. Benton J. Hall, both late Commissioners of Patents; Frank T. Brown, late Principal Examiner of Patents, and A. P. Smith, who was formerly in the examining corps in the Patent Office, have organized as Butterworth, Hall, Brown & Smith, attorneys and counselors at law, with patent law their specialty. They have offices at Washington and Chicago.

E. V. D'Invilliers, of Philadelphia, has gone to Southwest Virginia and North Carolina, to examine mineral property. His headquarters are at Pulaski, Va., during his absence.

James B. Coryell, of Williamsport, Pa., has been elected the president of the Centre Iron Company, of Bellefonte, Pa.

Samuel E. Luty, formerly connected with the press of Pittsburgh, has been appointed assistant secretary of the American Tinned Plate Association, with headquarters in the Lewis Block, Pittsburgh. W. C. Cronemeyer, of the United States Iron and Tin Plate Company, is secretary of the organization.

F. A. Pratt, president of the Pratt & Whitney Company, of Hartford, Conn., has sailed for Europe to look after the business of the concern abroad.

Albert Fink, who was formerly commissioner of the Trunk Line Association, has returned from Europe and will go to his old home in Kentucky.

W. M. Symington has accepted the position of vice-president of a lead-refining works at St. Louis connected with the Lead Trust.

Horatio Allen, the veteran mechanical engineer who built the engines of the old Collins Line side-wheel steamers, is enjoying a ripe old age at Mountain Station,

South Orange, N. J. Mr. Allen was president of the famous Novelty Iron Works, New York. He was born in the year 1800.

The New York Maritime Association recommend the establishment of a Department of Commerce, under a cabinet minister, to aid in restoring our ocean marine and to foster the carrying trade. The Department will interchangeably represent the Government and the commercial interest each to the other, affording direct access to the central authority, and intrust to a high official not only the policy ordered by Congress, but the duty of acquainting Congress with commercial needs. It will gather under one head many bureaus scattered through the departments, some partly duplicating work, and will simplify the governmental marine service for the common good.

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Cross-Cut Saw Handles—
Atkins' No. 1 Loop, $\frac{1}{2}$ pair, 28¢; No. 3, 18¢; No. 6, 16¢; No. 2 and No. 4, reversible, 13¢.

Boynton's Loop Saw Handles, 50¢... 60¢.

Champion... 15¢.

Hammers—

Barn Door patterns... 60¢ to 10¢ to 70¢.

Barn Door, New England... 60¢ to 10¢ to 70¢.

Samson Steel Anti-Friction... 55¢.

Orleans Steel... 55¢.

Hamilton Wrought Wood Track... 55¢.

U. S. Wood Track... 65¢.

Champion... 60¢ to 10¢.

Rider and Wooster, Medina Ydg. Co.'s list... 70¢.

Climax Anti-Friction... 60¢.

Climax Anti-Friction for Wood Track... 55¢.

Zenith for Wood Track... 55¢.

ed's Steel Arm... 50¢.

allene, Barn Door... 50¢.

Sterling's Imp'vd (Anti-Friction)... 65¢ to 10¢.

Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00.

Cheritree... 50¢ to 10¢.

Kidder... 50¢ to 10¢ to 60¢.

The Boss... 60¢ to 10¢.

Best Anti-Friction... 60¢ to 10¢.

Duplex (Wood Track)... 60¢ to 10¢ & 5¢.

Terry's Pat. $\frac{1}{2}$ doz pr. 4 in., \$10.00; 5 in., \$12.00.

Terry's Steel Anti-Friction Leader... 50¢ to 10¢.

Terry's Steel Anti-Friction Ideal... 50¢ to 10¢.

Cronk's Pat., No. 4, \$12.00; No. 5, \$14.00.

No. 6, \$18.00.

Wood Track Iron Clad, $\frac{1}{2}$ in., 10¢... 50¢ & 10¢.

Carrier Steel Anti-Friction... 50¢ to 50¢ & 5¢.

Architect, $\frac{1}{2}$ set \$6.00... 20¢.

Eclipse... 20¢ to 10¢.

Felix, $\frac{1}{2}$ set \$4.50... 20¢.

Richards... 30¢ to 30¢ to 10¢.

Lane's Steel Anti-Friction... 50¢.

Ball Bearing Door Hanger... 20¢ to 10¢ to 25¢.

Warner's Pat... 20¢ to 20¢ to 10¢.

Stearns' Anti-Friction... 20¢ to 20¢ to 10¢.

Stearns' Challenge... 25¢ to 10¢ to 25¢.

Faultless... 40¢ to 40¢ to 5¢.

American, $\frac{1}{2}$ set \$6.00... 20¢ to 10¢.

Rider & Wooster, No. 1, 62¢; No. 2, 75¢.

Paragon, Nos. 1, 2 and 3... 40¢ to 10¢.

Cincinnati... 25¢ to 10¢.

Paragon, Nos. 5, 5½, 7 and 8... 20¢ to 10¢.

Crescent... 60¢ to 60¢ to 10¢.

Nickel, Cast Iron... 50¢.

Nickel, Malleable Iron and Steel... 40¢.

Scranton Anti-Friction Single Strap... 33¢.

Scranton Anti-Friction Double Strap... 40¢.

Universal Anti-Friction... 40¢.

Wild West, 4 in. Wheel, \$15.00; 5 in., \$21.00.

Star... 40¢ to 10¢ to 40¢ to 10¢ & 5¢.

May... 50¢ to 50¢ to 10¢.

Barn... 40¢ to 10¢.

Harness Snaps—

See Snaps.

Hatches—

List Jan. 1, 1886.

Isaiah Blood... 36¢ to 40¢.

Hunt's Shingling, Lath and Claw... 40¢ to 5¢.

Hunt's Broad... 40¢.

Buffalo Hammer Co... 40¢ to 10¢ to 50¢.

Hurd's... 40¢ to 10¢ to 50¢.

Fayette R. Plumb... 40¢ to 10¢ to 50¢.

Wm. Mann, Jr., & Co... 50¢ to 50¢ & 5¢.

Underhill Edge Tool Co... 40¢ to 50¢ to 40¢ to 5¢.

Underhill's, Haines and Bright... 33¢.

C. Hammond & Son... 40¢ to 10¢ to 50¢.

Simmons... 40¢ to 10¢ to 50¢.

Peck's... 40¢ to 10¢ to 40¢ & 10¢ & 5¢.

Kelly's... 50¢ to 50¢ & 5¢.

Sargent & Co... 50¢.

Ten Eyck Edge Tool Co... 40¢ to 10¢ to 40¢ & 5¢.

Collins... 10¢.

Schulte, Lohoff & Co... 50¢ to 50¢ & 5¢.

Hay and Straw Knives—

Lighthill, Mfrs', price $\frac{1}{2}$ doz \$18.00, 25¢.

But Jobbers cut this price freely.

Gem... $\frac{1}{2}$ doz \$10.

Wadsworth's... 40¢ & 75¢ to 40¢ & 10¢.

Carter's Needles... $\frac{1}{2}$ doz \$11.50 to \$12.00.

Heath's... $\frac{1}{2}$ doz \$13.50 to 14.00.

Auburn Hay, Corn, and Spear Point... 50¢.

Auburn, Straw... 40¢.

Nolin's Hay... $\frac{1}{2}$ doz \$10.00.

Hinges—

Wrought Iron Hinges

Strap and T... 70¢ to 10¢ to 75¢.

Screw Hook and T... 6 to 12 in., $\frac{1}{2}$ in., 2-10¢.

Strap... 14 to 30 in., $\frac{1}{2}$ in., 3-7-10¢.

Heavy Welded... 6 to 12 in., $\frac{1}{2}$ in., 2-10¢.

Hook... 14 to 20 in., $\frac{1}{2}$ in., 3-7-10¢.

Screw Hook... 6 in., $\frac{1}{2}$ in., $\frac{1}{2}$ doz \$1.00.

and Eye... 9 in., $\frac{1}{2}$ in., $\frac{1}{2}$ doz \$2.45... 10¢.

Rolled Blind Hinges, Nos. 32 and 24... 50¢ to 10¢.

Rolled Blind Hinges, Nos. 232 and 234... 55¢ to 10¢.

Rolled Plate... 70¢ to 10¢.

Rolled Raised... 70¢ to 10¢.

Plate Hinges (8, 10 & 12 in., $\frac{1}{2}$ in., 5¢.

"Providence") over 12 in., $\frac{1}{2}$ in., 4¢.

Spring Hinges—

C. Hammond & Son, Blank Butts... 40¢.

Geer's Spring and Blank Butts... 40¢.

Union Spring Hinge Co.'s list, March 1886... 20¢.

Acme... 30¢.

U. S. 25¢ to 10¢.

Empire and Crown... 20¢.

Herc and Monarch... 55¢.

American, Gem, and Star... 20¢.

Oxford... 20¢.

Barker's Double Acting... 20¢ to 10¢.

Union Mfg. Co... 25¢.

Bommer's... 30¢.

Buckman's... 15¢ to 20¢.

Chicago... 30¢.

Wiles... 10¢.

Devore's... 40¢.

Rex... 40¢.

Royal... 60¢.

Reliable... 60¢.

Champion... 60¢.

Hinge Hinges—

Western... $\frac{1}{2}$ doz \$4.40, 60¢.

N. E. 60¢.

N. E. Reversible... $\frac{1}{2}$ doz \$7.00, 55¢.

Clark's, Nos. 1, 2, 3... 60¢ to 10¢ to 5¢.

N. Y. State... $\frac{1}{2}$ doz \$5.00, 55¢ to 10¢.

Automatic... $\frac{1}{2}$ doz pair \$12.50, 50¢.

Common Sense... $\frac{1}{2}$ doz pair \$4.50, 50¢.

Seymour's... 45¢ to 10¢.

Shepard's... 60¢ to 10¢ & 5¢.

Reed's Latch and Hinges. $\frac{1}{2}$ doz \$12.00, 50¢.

Blind Hinges—

Parker... 75¢ to 2¢.

Painer... 50¢ to 10¢.

Seymour... 70¢ to 10¢.

Nicholson... 45¢ to 10¢.

Huffer... 50¢.

Clark's, Nos. 1, 3, 5, 40 and 50... 75¢ to 10¢ to 5¢ to 80¢.

Clark's Mortise Gravity... 50¢.

Sargent's, Nos. 1, 3, 5, 11, 13... 75¢ to 10¢ to 5¢ to 80¢.

Reading's Gravity... 75¢ to 10¢ to 5¢ to 80¢.

Shepard's Noiseless... 75¢ to 10¢ to 5¢ to 80¢.

Nagara... 80¢ to 12¢.

Buffalo... 80¢ to 12¢.

Clark's Genuine Pat... 80¢ to 12¢.

O. S., Lull & Porter... 75¢ to 10¢ to 5¢ to 80¢.

Acme, Lull & Porter... 75¢ to 10¢ to 5¢ to 80¢.

Clinton City Reversible... 75¢ to 10¢ to 5¢ to 80¢.

Capewell... 75¢ to 10¢ to 5¢ to 80¢.

Star... 75¢ to 10¢ to 5¢ to 80¢.

10¢ to 12¢ to 10¢ to 80¢.

Anchor... 75¢ to 10¢ to 5¢ to 80¢.

Western... 75¢ to 10¢ to 5¢ to 80¢.

Empire Bronzed... 14¢ to 10¢.

Horse Shoes— See Shoes Horse.

Hose, Rubber—

Competition... 75¢ to 10¢ to 75¢ to 10¢ to 80¢.

Standard... 70¢ to 10¢ to 70¢ to 10¢ to 80¢.

Extra... 60¢ to 60¢ to 10¢ to 80¢.

N. Y. B. & P. Co., Para... 30¢ to 10¢.

N. Y. B. & P. Co., Extra... 50¢.

N. Y. B. & P. Co., Dundee... 60¢ to 10¢ to 80¢.

Huskers—

Blair's Adjustable... 8¢ gr. \$8.00.

Blair's Adjustable Clipper... 8¢ gr. 7.00.

Hubbard's Solid Steel... 8¢ gr. 4.50.

Huskies—

Blair's Adjustable... 8¢ gr. \$8.00.

Blair's Adjustable Clipper... 8¢ gr. 7.00.

Hubbard's Solid Steel... 8¢ gr. 4.50.

Indurated Fiber-Ware— 25¢.

Splitoons, No. 2, $\frac{1}{2}$ doz... 30¢.

Bins, Ringed... 2¢ doz. No. 1, \$4.80.

No. 2, \$4.20; No. 3, \$3.60.

Washtubs, Nested, Nos. 1, 2, 3 and 4 (4 pieces), $\frac{1}{2}$ nest... 37.50.

Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), $\frac{1}{2}$ nest... 37.50.

Keelers, Nested, Nos. 1, 2, 3 and 4 (4 pieces), $\frac{1}{2}$ nest... 37.50.

Hoists—

Spun, Stamped.

Brass, 7 to 17 in., 8¢... 24¢.

Brass, larger than 17 in., 8¢... 21¢.

Enamelled and Tea Kettles—

See Hollow Ware.

Keys—

Lock Asso'n list Dec. 30, 1886... 50¢ to 10¢.

60¢ to 5¢.

Eagle, Cabinet, &c... 33¢ to 22¢.

Brass, Ringed... 2¢ to 25¢.

Perfect Ringers... 2¢ to 25¢.

Blair's Hog Ringers... 2¢ to 25¢.

Blair's Hog Rings... 2¢ to 25¢.

Champion Ringers... 2¢ to 25¢.

Champion Rings Double... 2¢ to 25¢.

Brown's Ringers... 2¢ to 25¢.

Brown's Rings... 2¢ to 25¢.</p

Molasses Gates—		Birmingham Plane Co. 50@50&5%	Fort Madison Steel Tooth Lawn Rake. \$6.00..... 25%	Atkins' Silver Steel Diamond X Cuts
Stebbin's Pattern. 75@75&10%		Gage Tool Co.'s Self-Setting. 20&10%	J. R. Torrey Razor Co. 20%	Atkins' Special Steel Dexter X Cuts
Stebbin's Genuine. 60@10&10%		Chaplin's Iron Planes. 40@40&5%	Wostenholme and Butcher. \$10.00 to 2.	Atkins' Special Steel Diamond X Cuts
Stebbin's Tinned Ends. 40@10%		Sargent's. 30@10@30@10&10%		Atkins' Champion and Electric Tooth
Chase's Hard Metal. 50@10%		Plane Irons—		X Cuts. 20@25@30@35@40@45@50@55@60@65@70@75@80@85@90@95@100@105@110@115@120@125@130@135@140@145@150@155@160@165@170@175@180@185@190@195@200@205@210@215@220@225@230@235@240@245@250@255@260@265@270@275@280@285@290@295@300@305@310@315@320@325@330@335@340@345@350@355@360@365@370@375@380@385@390@395@400@405@410@415@420@425@430@435@440@445@450@455@460@465@470@475@480@485@490@495@500@505@510@515@520@525@530@535@540@545@550@555@560@565@570@575@580@585@590@595@600@605@610@615@620@625@630@635@640@645@650@655@660@665@670@675@680@685@690@695@700@705@710@715@720@725@730@735@740@745@750@755@760@765@770@775@780@785@790@795@800@805@810@815@820@825@830@835@840@845@850@855@860@865@870@875@880@885@890@895@900@905@910@915@920@925@930@935@940@945@950@955@960@965@970@975@980@985@990@995@1000@1005@1010@1015@1020@1025@1030@1035@1040@1045@1050@1055@1060@1065@1070@1075@1080@1085@1090@1095@1100@1105@1110@1115@1120@1125@1130@1135@1140@1145@1150@1155@1160@1165@1170@1175@1180@1185@1190@1195@1200@1205@1210@1215@1220@1225@1230@1235@1240@1245@1250@1255@1260@1265@1270@1275@1280@1285@1290@1295@1300@1305@1310@1315@1320@1325@1330@1335@1340@1345@1350@1355@1360@1365@1370@1375@1380@1385@1390@1395@1400@1405@1410@1415@1420@1425@1430@1435@1440@1445@1450@1455@1460@1465@1470@1475@1480@1485@1490@1495@1500@1505@1510@1515@1520@1525@1530@1535@1540@1545@1550@1555@1560@1565@1570@1575@1580@1585@1590@1595@1600@1605@1610@1615@1620@1625@1630@1635@1640@1645@1650@1655@1660@1665@1670@1675@1680@1685@1690@1695@1700@1705@1710@1715@1720@1725@1730@1735@1740@1745@1750@1755@1760@1765@1770@1775@1780@1785@1790@1795@1800@1805@1810@1815@1820@1825@1830@1835@1840@1845@1850@1855@1860@1865@1870@1875@1880@1885@1890@1895@1900@1905@1910@1915@1920@1925@1930@1935@1940@1945@1950@1955@1960@1965@1970@1975@1980@1985@1990@1995@2000@2005@2010@2015@2020@2025@2030@2035@2040@2045@2050@2055@2060@2065@2070@2075@2080@2085@2090@2095@2100@2105@2110@2115@2120@2125@2130@2135@2140@2145@2150@2155@2160@2165@2170@2175@2180@2185@2190@2195@2200@2205@2210@2215@2220@2225@2230@2235@2240@2245@2250@2255@2260@2265@2270@2275@2280@2285@2290@2295@2300@2305@2310@2315@2320@2325@2330@2335@2340@2345@2350@2355@2360@2365@2370@2375@2380@2385@2390@2395@2400@2405@2410@2415@2420@2425@2430@2435@2440@2445@2450@2455@2460@2465@2470@2475@2480@2485@2490@2495@2500@2505@2510@2515@2520@2525@2530@2535@2540@2545@2550@2555@2560@2565@2570@2575@2580@2585@2590@2595@2600@2605@2610@2615@2620@2625@2630@2635@2640@2645@2650@2655@2660@2665@2670@2675@2680@2685@2690@2695@2700@2705@2710@2715@2720@2725@2730@2735@2740@2745@2750@2755@2760@2765@2770@2775@2780@2785@2790@2795@2800@2805@2810@2815@2820@2825@2830@2835@2840@2845@2850@2855@2860@2865@2870@2875@2880@2885@2890@2895@2900@2905@2910@2915@2920@2925@2930@2935@2940@2945@2950@2955@2960@2965@2970@2975@2980@2985@2990@2995@3000@3005@3010@3015@3020@3025@3030@3035@3040@3045@3050@3055@3060@3065@3070@3075@3080@3085@3090@3095@3100@3105@3110@3115@3120@3125@3130@3135@3140@3145@3150@3155@3160@3165@3170@3175@3180@3185@3190@3195@3200@3205@3210@3215@3220@3225@3230@3235@3240@3245@3250@3255@3260@3265@3270@3275@3280@3285@3290@3295@3300@3305@3310@3315@3320@3325@3330@3335@3340@3345@3350@3355@3360@3365@3370@3375@3380@3385@3390@3395@3400@3405@3410@3415@3420@3425@3430@3435@3440@3445@3450@3455@3460@3465@3470@3475@3480@3485@3490@3495@3500@3505@3510@3515@3520@3525@3530@3535@3540@3545@3550@3555@3560@3565@3570@3575@3580@3585@3590@3595@3600@3605@3610@3615@3620@3625@3630@3635@3640@3645@3650@3655@3660@3665@3670@3675@3680@3685@3690@3695@3700@3705@3710@3715@3720@3725@3730@3735@3740@3745@3750@3755@3760@3765@3770@3775@3780@3785@3790@3795@3800@3805@3810@3815@3820@3825@3830@3835@3840@3845@3850@3855@3860@3865@3870@3875@3880@3885@3890@3895@3900@3905@3910@3915@3920@3925@3930@3935@3940@3945@3950@3955@3960@3965@3970@3975@3980@3985@3990@3995@4000@4005@4010@4015@4020@4025@4030@4035@4040@4045@4050@4055@4060@4065@4070@4075@4080@4085@4090@4095@4100@4105@4110@4115@4120@4125@4130@4135@4140@4145@4150@4155@4160@4165@4170@4175@4180@4185@4190@4195@4200@4205@4210@4215@4220@4225@4230@4235@4240@4245@4250@4255@4260@4265@4270@4275@4280@4285@4290@4295@4300@4305@4310@4315@4320@4325@4330@4335@4340@4345@4350@4355@4360@4365@4370@4375@4380@4385@4390@4395@4400@4405@4410@4415@4420@4425@4430@4435@4440@4445@4450@4455@4460@4465@4470@4475@4480@4485@4490@4495@4500@4505@4510@4515@4520@4525@4530@4535@4540@4545@4550@4555@4560@4565@4570@4575@4580@4585@4590@4595@4600@4605@4610@4615@4620@4625@4630@4635@4640@4645@4650@4655@4660@4665@4670@4675@4680@4685@4690@4695@4700@4705@4710@4715@4720@4725@4730@4735@4740@4745@4750@4755@4760@4765@4770@4775@4780@4785@4790@4795@4800@4805@4810@4815@4820@4825@4830@4835@4840@4845@4850@4855@4860@4865@4870@4875@4880@4885@4890@4895@4900@4905@4910@4915@4920@4925@4930@4935@4940@4945@4950@4955@4960@4965@4970@4975@4980@4985@4990@4995@5000@5005@5010@5015@5020@5025@5030@5035@5040@5045@5050@5055@5060@5065@5070@5075@5080@5085@5090@5095@5100@5105@5110@5115@5120@5125@5130@5135@5140@5145@5150@5155@5160@5165@5170@5175@5180@5185@5190@5195@5200@5205@5210@5215@5220@5225@5230@5235@5240@5245@5250@5255@5260@5265@5270@5275@5280@5285@5290@5295@5300@5305@5310@5315@5320@5325@5330@5335@5340@5345@5350@5355@5360@5365@5370@5375@5380@5385@5390@5395@5400@5405@5410@5415@5420@5425@5430@5435@5440@5445@5450@5455@5460@5465@5470@5475@5480@5485@5490@5495@5500@5505@5510@5515@5520@5525@5530@5535@5540@5545@5550@5555@5560@5565@5570@5575@5580@5585@5590@5595@5600@5605@5610@5615@5620@5625@5630@5635@5640@5645@5650@5655@5660@5665@5670@5675@5680@5685@5690@5695@5700@5705@5710@5715@5720@5725@5730@5735@5740@5745@5750@5755@5760@5765@5770@5775@5780@5785@5790@5795@5800@5805@5810@5815@5820@5825@5830@5835@5840@5845@5850@5855@5860@5865@5870@5875@5880@5885@5890@5895@5900@5905@5910@5915@5920@5925@5930@5935@5940@5945@5950@5955@5960@5965@5970@5975@5980@5985@5990@5995@6000@6005@6010@6015@6020@6025@6030@6035@6040@6045@6050@6055@6060@6065@6070@6075@6080@6085@6090@6095@6100@6105@6110@6115@6120@6125@6130@6135@6140@6145@6150@6155@6160@6165@6170@6175@6180@6185@6190@6195@6200@6205@6210@6215@6220@6225@6230@6235@6240@6245@6250@6255@6260@6265@6270@6275@6280@6285@6290@6295@6300@6305@6310@6315@6320@6325@6330@6335@6340@6345@6350@6355@6360@6365@6370@6375@6380@6385@6390@6395@6400@6405@6410@6415@6420@6425@6430@6435@6440@6445@6450@6455@6460@6465@6470@6475@6480@6485@6490@6495@6500@6505@6510@6515@6520@6525@6530@6535@6540@6545@6550@6555@6560@6565@6570@6575@6580@6585@6590@6595@6600@6605@6610@6615@6620@6625@6630@6635@6640@6645@6650@6655@6660@6665@6670@6675@6680@6685@6690@6695@6700@6705@6710@6715@6720@6725@6730@6735@6740@6745@6750@6755@6760@6765@6770@6775@6780@6785@6790@6795@6800@6805@6810@6815@6820@6825@6830@6835@6840@6845@6850@6855@6860@6865@6870@6875@6880@6885@6890@6895@6900@6905@6910@6915@6920@6925@6930@6935@6940@6945@6950@6955@6960@6965@6970@6975@6980@6985@6990@6995@7000@7005@7010@7015@7020@7025@7030@7035@7040@7045@7050@7055@7060@7065@7070@7075@7080@7085@7090@7095@7100@7105@7110@7115@7120@7125@7130@7135@7140@7145@7150@7155@7160@7165@7170@7175@7180@7185@7190@7195@7200@7205@7210@7215@7220@7225@7230@7235@7240@7245@7250@7255@7260@7265@7270@7275@7280@7285@7290@7295@7300@7305@7310@7315@7320@7325@7330@7335@7340@7345@7350@7355@7360@7365@7370@7375@7380@7385@7390@7395@7400@7405@7410@7415@7420@7425@7430@7435@7440@7445@7450@7455@7460@7465@7470@7475@7480@7485@7490@7495@7500@7505@7510@7515@7520@7525@7530@7535@7540@7545@7550@7555@7560@7565@7570@7575@7580@7585@7590@7595@7600@7605@7610@7615@7620@7625@7630@7635@7640@7645@7650@7655@7660@7665@7670@7675@7680@7685@7690@7695@7700@7705@7710@7715@7720@7725@7730@7735@7740@7745@7750@7755@7760@7765@7770@7775@7780@7785@7790@7795@7800@7805@7810@7815@7820@7825@7830@7835@7840@7845@7850@7855@7860@7865@7870@7875@7880@7885@7890@7895@7900@7905@7910@7915@7920@7925@7930@7935@7940@7945@7950@7955@7960@7965@7970@7975@7980@7985@7990@7995@8000@8005@8010@8015@8020@8025@8030@8035@8040@8045@8050@8055@8060@8065@8070@8075@8080@8085@8090@8095@8100@8105@8110@8115@8120@8125@8130@8135@8140@8145@8150@8155@8160@8165@8170@8175@8180@8185@8190@8195@8200@8205@8210@8215@8220@8225@8230@8235@8240@8245@8250@8255@8260@8265@8270@8275@8280@8285@8290@8295@8300@8305@8310@8315@8320@8325@8330@8335@8340@8345@8350@8355@8360@8365@8370@8375@8380@8385@8390@8395@8400@8405@8410@8415@8420@8425@8430@8435@8440@8445@8450@8455@8460@8465@8470@8475@8480@8485@8490@8495@8500@8505@8510@8515@8520@8525@8530@8535@8540@8545@8550@8555@8560@8565@8570@8575@8580@8585@8590@8595@8600@8605@8610@8615@8620@8625@8630@8635@8640@8645@8650@8655@8660@8665@8670@8675@8680@8685@8690@8695@8700@8705@8710@8715@8720@8725@8730@8735@8740@8745@8750@8755@8760@8765@8770@8775@8780@8785@8790@8795@8800@8805@8810@8815@8820@8825@8830@8835@8840@8845@8850@8855@8860@8865@8870@8875@8880@8885@8890@8895@8900@8905@8910@8915@8920@8925@8930@8935@8940@8945@8950@8955@8960@8965@8970@8975@8980@8985@8990@8995@9000@9005@9010@9015@9020@9025@9030@9035@9040@9045@9050@9055@9060@9065@9070@9075@9080@9085@9090@9095@9100@9105@9110@9115@9120@9125@9130@9135@9140@9145@9150@9155@9160@9165@9170@9175@9180@9185@9190@9195@9200@9205@9210@9215@9220@9225@9230@9235@9240@9245@9250@9255@9260@9265@9270@9275@9280@9285@9290@9295@9300@9305@9310@9315@9320@9325@9330@9335@9340@9345@9350@9355@9360@9365@9370@9375@9380@9385@9390@9395@9400@9405@9410@9415@9420@9425@9430@9435@9440@9445@9450@9455@9460@9465@9470@9475@9480@9485@9490@9495@9500@9505@9510@9515@9520@9525@9530@9535@9540@9545@9550@9555@9560@9565@9570@9575@9580@9585@9590@9595@9600@9605@9610@9615@9620@9625@9630@9635@9640@9645@9650@9655@9660@9665@9670@9675@9680@9685@9690@9695@9700@9705@9710@9715@9720@9725@9730@9735@9740@9745@9750@9755@9760@9765@9770@9775@9780

Machine—	
Flat Head, Iron.....	.55%
Round Head, Iron.....	.50%
Bench and Hand—	
Bench, Iron.....	.55&10&55&10&10%
Bench, Wood, Beech.....	7 doz \$2.25
Bench, Wood, Hickory.....	20&10%
Hand, Wood.....	.25&10&25&10&5%
Lag, Blunt Point, according to size.....	.75&10&80%
Coach and Lag, Gimlet Point.....	.75%
Bed.....	.25&5%
Hand Rail, Sawn.....	.65&10%
Hand Rail, S. & B. Mfg. Co.70&10&75%
Hand Rail, Am. Screw Co.75%
Cincinnati.....	.25&10%
Spoke Trimmers—	
Bonney's.....	7 doz \$10.00, 50%
Stearns'.....	40&10%
Stearns'.....	20&10&30%
Cincinnati.....	.25&10%
Spoons and Forks—	
Tinned Iron—	
Basting, Cen. Stamp, Co.'s list.....	.70&10%
Solid Table and Tea, Cen. Stamp, Co.'s list.....	.70&10%
Buffalo S. S. & Co.33&12%
Silver-Plated (4 mos. or 52 cash 30 days).....	
Meriden Brit. Co., Rogers.....	.50%
C. Rogers & Bros.....	.50%
Rogers & Bros.....	.50%
Reed & Barton.....	.50%
Wm. Rogers Mfg. Co.50&10&60%
Simpson, Hall, Miller & Co.50&10%
Holmes & Edwards Silver Co.60&6&5%
L. Boardman & Son.50&10%
Miscellaneous—	
German Silver.....	.50&50&65
German Silver, Hall & Elton.....	.50&55 cash
Nickel Silver.....	.50&50&50&10&55 cash
Britannia.....	.60%
Boardman's Nickel Silver.....	.50
Boardman's Britannia Spoons, case lots.....	.50
Shears—	
American (Cast) Iron.....	.75&10&75&10&5%
Pruning, See Pruning Hooks and Shears.	
Barnard's Lamp Trimmers.....	7 doz \$3.75
Tinners—	
Seymour's, List Dec. 1881.....	.50&10&10&60&10&10&5%
Heinisch's, List, Dec. 1881.....	.60&10&10&60&10&10&5%
Heinisch's Tailor's Shears.....	.33&12%
First quality C. S. Trimmers.....	.30&8&80&10%
Second quality C. S. Trimmers.....	.30&10&80&10&10%
Acme Cast Shears.....	.10&10%
Diamond Cast Shears.....	.10%
Clipper.....	.10&10%
Victor Cast Shears.....	.75&10&75&10&5%
Howe Bros. & Hubert, Solid Forged Steel.....	.40%
Chicago, Drop Forge & F. Co., Solid Steel Forged.....	.60%
Clause Shear Co., Japanned.....	.70%
Clause Shear Co., Nickleed, same list.....	.60%
Sheaves—	
Sliding Door—	
M. W. Co., list July, 1888.....	.50&10&60&5%
R. & E. list Dec. 18, 1885.....	.55&20%
Corbin's list.....	.60&10&20%
Patent Roller.....	.60&10&25%
Patent Roller, Hatfield's.....	.75%
Russell's Anti-Friction, list Dec. 18, 1885.....	.60&25%
Moore's Anti-Friction.....	.50%
Sliding Shutter—	
R. & E. list Dec. 18, 1885.....	.80&10&82%
Sargent's list.....	.60&10%
Reading list.....	.60&10&10%
Ship Tools—	
L. & J. White.....	.20&25%
Albertson Mfg. Co.25%
Shoes,orse, Mule, &c.—	
Horse—	
Burden's, Perkins' Phoenix, at factory.	\$4.00
Mule—	
Add \$1 per keg to above prices.	
Or, Wrought—	
Ton lots.....	per lb 9¢
1000 lb lots.....	per lb 8¢
500 lb lots.....	per lb 10¢
Shot—	
(Eastern prices 2¢ off, cash, 5 days.)	
Drop, 7 lb bag, 25 lb.....	\$1.21
Drop, 7 lb bag, 5 lb.....	.30
Buck and Chilled, 7 lb bag, 25 lb.....	1.46
Buck and Chilled, 7 lb bag, 35 lb.....	.35
Shovels and Spades—	
Acme Shovels, Spades, &c., list Nov. 1, 1885.....	.20%
Note.—Jobbers frequently give 5% off extra on above.	
Griffith's Black Iron.....	.50&10%
Griffith's C. S.60&8&60&10%
Griffith's Solid C. S. R. R. Goods.....	.20%
Old Colony (Sanford Fork & Tool Co.) 35 lb Sack, 20 lb Box.....	.50&20&75%
Hussey, Birns & Co.15&25%
Hubbard & Co.20&20&75%
Lehigh Mfg. Co.50&10%
Payne Pettebone & Son, list January, 1886.....	.30%
Remington's (Lowman's Pat. No. 10&40%) Rowland's, Black Iron.....	.50&10%
Rowland's Steel.....	.60&10&60&10%
Shovels and Tonga—	
Iron Head.....	.60&10&60&10&5%
Brass Head.....	.60&10&10%
Skeins, Thimble—	
Western list.....	.75&10&75&10%
Columbus Wrt. Steel, list Jan. 3, 1889.....	.45&10%
Coldbrookdale Iron Co.50&10%
Utica P. S. T. Skeins.....	.60%
Utica Turned and Fitted.....	.35%
Sieves—	
Buffalo Metallic, S. S. & Co.50&25%
Shaker (Barber's Pat.) Flour Sifters.....	
7 doz \$2.00; per gr \$21.00	
Electric.....	per gr \$18.00
Hunter's.....	per gr \$2.00
Smith's Adjustable Sifters.....	per gr \$2.00
Smith's Adjustable Milk Strainer.....	per gr \$2.00
Smith's Adjustable T. & C. Strainer.....	per doz \$1.25
Stoves, Wooden Rim—	
Iron, Plated.....	
Mash 18, Nested, 7 lb.....	.95¢
Mash 20, Nested, 7 lb.....	.90¢ \$1.05
Mash 24, Nested, 7 lb.....	\$1.10
States—	
School, by case.....	.50&50&10%
Snaps, Harness, &c.—	
Anchor (T. & S. Mfg. Co.).....	.65¢
Fitch's (Bristol).....	.50&10%
Hotch'k's.....	.10%
Andrews.....	.50%
Sargent, Patent Guarded.....	.70&10&10%
German, new list.....	.40&10%
Cover.....	.50&25%
Cover, New Patent.....	.50&5&25%
Cover, New R. E.....	.60&10&25%
Covered Spring.....	.60&10&10%
Soldering Irons—	
Covers' Adjustable, list Jan. 1, 1886.....	
35&23	
Spoke Shaves—	
Iron.....	.45%
Wood.....	.30%
Bailey's (Stanley R. & L. Co.).....	.40&10%
Stearns'.....	.20&10&30%
Cincinnati.....	.25&10%
Spoke Trimmers—	
Bonney's.....	7 doz \$10.00, 50%
Ives' No. 1, \$15.00; No. 2, \$12.00 per doz	
Douglas'.....	7 doz \$9.00, 20%
Cincinnati.....	.25¢
Spoons and Forks—	
Tinned Iron—	
Basting, Cen. Stamp, Co.'s list.....	.70&10%
Solid Table and Tea, Cen. Stamp, Co.'s list.....	.70&10%
Buffalo S. S. & Co.33&12%
Silver-Plated (4 mos. or 52 cash 30 days).....	
Meriden Brit. Co., Rogers.....	.50%
Rogers & Bros.....	.50%
Reed & Barton.....	.50%
Wm. Rogers Mfg. Co.50&10&60%
Simpson, Hall, Miller & Co.50&10%
Holmes & Edwards Silver Co.60&6&5%
L. Boardman & Son.50&10%
Miscellaneous—	
German Silver.....	.50&50&65
German Silver, Hall & Elton.....	.50&55 cash
Nickel Silver.....	.50&50&50&10&55 cash
Britannia.....	.60%
Boardman's Nickel Silver.....	.50
Boardman's Britannia Spoons, case lots.....	.50
Shears—	
American (Cast) Iron.....	.75&10&75&10&5%
Pruning, See Pruning Hooks and Shears.	
Barnard's Lamp Trimmers.....	7 doz \$3.75
Tinners—	
Seymour's, List Dec. 1881.....	.50&10&10&60&10&10&5%
Heinisch's, List, Dec. 1881.....	.60&10&10&60&10&10&5%
Heinisch's Tailor's Shears.....	.33&12%
First quality C. S. Trimmers.....	.30&8&80&10%
Second quality C. S. Trimmers.....	.30&10&80&10&10%
Acme Cast Shears.....	.10&10%
Diamond Cast Shears.....	.10%
Clipper.....	.10&10%
Victor Cast Shears.....	.75&10&75&10&5%
Howe Bros. & Hubert, Solid Forged Steel.....	.40%
Chicago, Drop Forge & F. Co., Solid Steel Forged.....	.60%
Clause Shear Co., Japanned.....	.70%
Clause Shear Co., Nickleed, same list.....	.60%
Sheaves—	
Sliding Door—	
M. W. Co., list July, 1888.....	.50&10&60&5%
R. & E. list Dec. 18, 1885.....	.55&20%
Corbin's list.....	.60&10&20%
Patent Roller.....	.60&10&25%
Patent Roller, Hatfield's.....	.75%
Russell's Anti-Friction, list Dec. 18, 1885.....	.60&25%
Moore's Anti-Friction.....	.50%
Sliding Shutter—	
R. & E. list Dec. 18, 1885.....	.80&10&82%
Sargent's list.....	.60&10%
Reading list.....	.60&10&10%
Ship Tools—	
L. & J. White.....	.20&25%
Albertson Mfg. Co.25%
Shoes,orse, Mule, &c.—	
Horse—	
Burden's, Perkins' Phoenix, at factory.	\$4.00
Mule—	
Add \$1 per keg to above prices.	
Or, Wrought—	
Ton lots.....	per lb 9¢
1000 lb lots.....	per lb 8¢
500 lb lots.....	per lb 10¢
Shot—	
(Eastern prices 2¢ off, cash, 5 days.)	
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CURRENT METAL PRICES.

DECEMBER 4, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:

1/4 to 2 in. round and square...	200 @	....
1 to 6 in. x 1/2 to 1 in.	200 @	....
1/4 to 2 in. round and square...	200 @	....
1 to 4 in. x 1/2 to 1 1/2 in.	200 @	....
1/4 to 6 in. x 1/2 to 1 in.	200 @	....
1 to 6 in. x 1/2 to 1 in.	200 @	....
Bands—1/2 and 1 1/2 round and square...	200 @	....
Bands—1 to 6 x 1 1/2 to No. 12.	200 @	....
" Burden Best" Iron, base price.	300 @	....
Euroen's "H. B. & S." Iron, base price.	280 @	....
" Ulster"	300 @	....
Norway Rods.	400 @	5.00

Merchant Steel from Store.

Per pound.

Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shot, base price in small lots.	25¢
Best Cast Steel, base price in small lots.	8¢
Best Cast Steel Machinery, base price in small lots.	5¢

Sheet Iron from Store.

Common American.	R. G. Cleaned.
10 to 16.	3.00 @ 3.00
17 to 20.	3.25 @ 3.50
21 to 24.	3.85 @ 3.75
25 and 30.	3.45 @ 3.75
27.	3.55 @ 3.75
28.	3.75 @ 4.00
	B. R.
Galv'd, 14 to 20.	5.00 @ 4.75
Galv'd, 1 to 24.	5.875 @ 5.125
Galv'd, 25 to 30.	5.75 @ 5.50
Galv'd, 27.	6.125 @ 5.85
Galv'd, 28.	6.50 @ 6.25
Patent Plated.	10 @ 10
Russia.	94¢ @ 10¢
American Cold Rolled B. R.	5¢ @ 7¢
Craig Polished sheet Steel.	8¢ @ 84¢

English Steel from Store.

Best Cast.	15 @
Extra Cast.	16 1/2 @ 17
Swaged, Cast.	16
Best Double Shear.	15
Blister, 1st quality.	12
German Steel, Best.	10
2d quality.	9
3d quality.	8
Sheet Cast Steel, 1st quality.	15
2d quality.	14
3d quality.	12 1/2

METALS.

Tin.

Per lb.

Banca, Pigs.	23
Straits, Pigs.	23 1/2
English, Pigs.	23 1/2
Straits in Bars.	23 1/2

Tin Plates.

Charcoal Plates.—Bright.

Per box.

Melyn Grade.	10 x 14.	36 1/2
"	12 x 12.	675
"	14 x 20.	6.50
"	16 x 20.	18.00
"	18 x 14.	8.00
"	18 x 12.	8.25
"	14 x 12.	8.00
"	14 x 20.	15.75
"	16 x 20.	15.75
"	18 x 12.	15.75
"	18 x 14.	15.75
"	18 x 16.	15.75
"	18 x 18.	15.75
"	20 x 20.	15.75
"	22 x 22.	15.75
"	24 x 24.	15.75
"	26 x 26.	15.75
"	28 x 28.	15.75
"	30 x 30.	15.75
"	32 x 32.	15.75
"	34 x 34.	15.75
"	36 x 36.	15.75
"	38 x 38.	15.75
"	40 x 40.	15.75
"	42 x 42.	15.75
"	44 x 44.	15.75
"	46 x 46.	15.75
"	48 x 48.	15.75
"	50 x 50.	15.75
"	52 x 52.	15.75
"	54 x 54.	15.75
"	56 x 56.	15.75
"	58 x 58.	15.75
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